IN THE

Supreme Court of the United States.

No. 1,105.—October Term, 1879.

WOODBURY PATENT PLANING MACHINE CO.

vs.

ALLEN W. KEITH.

STATEMENT AND AFFIDAVIT OPPOSING SUBMISSION ON PRINTED BRIEF.

JOHN E. HATCH,
Of Counsel.

J. L. Pearson, Printer, 9th and D sts., Washington.

IN THE

Supreme Court of the United States.

No. 1,105—October Term, 1879.

Woodbury Patent Planing Machine Co.

vs.

Allen W. Keith.

Opposing Submission Under Rule 20.

I desire to oppose this proposed submission, as one of the counsel representing the appellee.

The question involved is, whether a patent granted one Woodbury in 1873, upon an application first made in 1848, for an important feature of the common planing machine, that had been in public and common use upon all such machines for a quarter of a century before the grant of the patent, is valid.

The case is defended by a combination of interested manufacturers, among whom are Mr. Gould, who employs Mr. Rice and Mr. Thurston, and Mr. Doane, president of J. A. Fay & Co., of Cincinnati, who employs me. Neither

of us represent Mr. Keith directly, as he is simply the user of one machine, and is defended by the manufacturers.

Mr. Doane being entirely satisfied with the management of the case below, I did not appear in it, and appear now simply to protest, in his name, against this submission.

The case is defended on the ground of abandonment, and also on the ground that one Anson had and used publicly such a machine before Woodbury's alleged invention.

Mr. Thurston's brief relates almost entirely to the question of abandonment. This is a point of law that can be tried just as well on printed brief as on oral argument. There is no objection to the submission, so far as this point is concerned. On this point the brief itself is in every way satisfactory. We feel there is nothing to be added.

But the case was decided in our favor below on the other point, the Anson machine.

If the court (which I do not anticipate) should decide against us on the question of abandonment, considered in my friend's brief, and should come to the consideration of the Anson machine, then there should be oral argument.

In the briefs submitted here, there is an important question of fact in issue bearing on this point, as to whether or not this machine shows one of the elements of the combination patented.

The briefs for appellant claim that it does not show this element—the solid bed.

The briefs for appellee state but do not fully *show* the reverse. The best settlement of the matter is by the machine itself or a large drawing agreed to by the parties, explained orally before the court, as the machine is not a little complicated. On the determination may depend the issue of the whole suit.

It is true the court could itself examine the machines if the case were submitted, but if any of the parts should become disarranged, it might not be discovered, and a wrong impression given.

The case is one of importance, interesting every planing-mill, sash and door factory, floor factory, car manufacturing establishment; indeed, every place where wood is operated upon in the country. The complainant has allowed the alleged improvement to be used over a quarter of a century without protest. It will not be an injury to wait two years longer.

My client cannot see why he should assist in an earlier determination, where he believes it prejudicial to his interests and the interests of the public as well.

I refer to his affidavit herewith printed.

Respectfully submitted.

JOHN E. HATCH,
Of Counsel for Appellee.

SUPREME COURT OF THE UNITED STATES.

October Term, 1879.

THE WOODBURY PATENT PLANING MACHINE COMPANY
vs.
ALLEN W. KEITH. } No. 1,105.

DISTRICT OF COLUMBIA,
CITY AND COUNTY OF WASHINGTON. } *ss.*

W. Howard Doane, being duly sworn, deposes and says: That he is president of J. A. Fay & Co., a corporation organized under the laws of the State of Ohio, having its

principal office in the city of Cincinnati, and engaged in the manufacture of wood-working machinery, and particularly in the manufacture and sale of planing machines; that after the organization of the Woodbury Patent Planing Machine Company, the appellant herein, in order to test the validity of the patent involved in the above-entitled suit, Mr. Keith, the appellee, was selected by a combination of manufacturers composed of S. A. Wood & Co., of Boston, C. B. Rogers & Co., of Norwich, Connecticut, (Lyman Gould, president,) Witherby, Rugg & Richardson, of Worcester, Mass., J. A. Fay & Co., of Cincinnati, H. B. Smith & Co., of Smithville, N. J., and others; that the said body of manufacturers undertook to employ counsel and defend the case against Keith; that a sub-committee, composed of L. Gould, H. B. Smith, and affiant, were appointed by the said combination of manufacturers to have charge of the defence; that the case was defended at large expense, J. A. Fay & Co. itself contributing over $2,000 in connection with the same; that the case having been heard below and decided in favor of the defendant (the judge holding the patent invalid), and the case having been now appealed, it is proposed by the counsel representing certain of the other parties interested in the defence, that the case be submitted on printed briefs without oral argument. To this course affiant, in the name of his company, desires respectfully to object, if this case is to be considered as a test case under the patent and binding upon all the parties that have been connected with the defence, for the following reasons:

1. Because the case is one of such magnitude and importance to the manufacturing interests of the country that it should be fully and carefully heard upon oral argument.

2. There are in the case a large number of models or full-sized machines that cannot be readily understood without careful oral explanation, wherein the court have an opportunity of asking questions as to any points not readily understood.

3. There are among the papers proposed to be submitted no full-sized drawings or sketches of these machines.

4. If the case is considered upon printed briefs without the presence of the parties who understand the machinery, it would be possible for some parts of these important exhibits to be disarranged or accidentally removed and the omission not brought fully to the attention of the court.

For these and other reasons, affiant respectfully requests that the case may be heard upon oral argument at the final hearing, and that he have an opportunity to be present by counsel and participate in such hearing.

W. HOWARD DOANE.

Subscribed and sworn to before me, this 15th day of January, A. D. 1880.

A. JOHNS,
U. S. Commissioner, Dist. of Col.

Filed 15 January, 1880.

Circuit Court of the United States,

DISTRICT OF MASSACHUSETTS.

IN EQUITY.

~~No. 648.~~

The Woodbury Patent Planing Machine Co.,

COMPLAINANT,

v.

Allen W. Keith,

DEFENDANT.

Transcript of Record

VOL. II.

EXHIBITS.

~~A. A. STROUT,~~
~~J. A. L. WHITTIER,~~ } ~~*for Compiainant.*~~

~~BENJAMIN F. THURSTON,~~
~~DAVID HALL RICE,~~ } ~~*for Defendant.*~~

~~BOSTON:~~
~~PRINTED UNDER DIRECTION OF THE CLERK.~~
~~1877.~~

TABLE OF CONTENTS.

Clerk's certificate Page 398

Page

Complainants' Exhibit No. 1. — Certified copy of the letters patent of the United States, No. 138,462, granted to Joseph P. Woodbury, April 29, 1873, for an "Improvement in Planing Machines" (put in evidence, p. 17, vol. 1) 1

Complainants' Exhibit No. 2. — Certified copy, from the Patent Office of the United States, of the assignment of letters patent of the United States, No. 138,462, dated April 29, 1873, to the Woodbury Patent Planing Machine Company (put in evidence, p. 18, vol. 1) 6

Complainants' Exhibit No. 3. — Notice of the Woodbury Patent Planing Machine Company to Allen W. Keith, dated Boston, November 22, 1875 (put in evidence, p. 25, vol. 1) . 8

Complainants' Exhibit No. 4. — Board (put in evidence, p. 469, vol. 1)

" " 5. " (" " " ")

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" " 13. " (" " " ")

Complainants' Exhibit No. 14. — Planing Machine (put in evidence, p. 469, vol. 1) . . . . . .

Complainants' Exhibit No. 15. — Samuel E. Brown's bill to the Jones Manufacturing Co. (put in evidence, p. 476, vol. 1) . 9

Complainants' Exhibit No. 16. — Account book produced by Henry F. Lee (put in evidence, p. 482, vol. 1) . . . . .

Complainants' Exhibit No. 17. — Strip of board (put in evidence, p. 515, vol. 1) . . . . . .

Complainants' Exhibit No. 18*a* } Paper with drawing on both sides,
" " " 18*b* } produced by Enos G. Allen, is marked on the roll-side 18*a*, and on the bar-side 18*b* (put in evidence, p. 518, vol. 1) . .

Complainants' Exhibit No. 19. — Long strip of moulding (put in evidence, p. 524, vol. 1) . . . . . .

Complainants' Exhibit No. 19*a*. — Small piece of moulding (put in evidence, p. 524, vol. 1) . . . . . .

Complainants' Exhibit No. 19*b*. — Small piece of moulding (put in evidence, p. 524, vol. 1) . . . . . .

Complainants' Exhibit No. 20. — Piece of moulding (put in evidence, p. 558, vol. 1) . . . . . .

Complainants' Exhibit No. 21. — Piece of moulding (put in evidence, p. 558, vol. 1) . . . . . .

Complainants' Exhibit No. 22. — Piece of moulding (put in evidence, p. 558, vol. 1) . . . . . .

Complainants' Exhibit No. 23. — Piece of moulding (put in evidence, pp. 558–562, vol. 1) . . . . . .

Complainants' Exhibit No. 24. — Piece of moulding (put in evidence, p. 562, vol. 1) . . . . . .

Complainants' Exhibit No. 25. — Piece of moulding (put in evidence, p. 562, vol. 1) . . . . . .

Complainants' Exhibit No. 26. — Piece of moulding (put in evidence, p. 562, vol. 1.) . . . . . .

Complainants' Exhibit No. 27. — Copy of Joseph P. Woodbury's caveat for a planing machine, dated May 28, 1846 (put in evidence, p. 617, vol. 1) 9

Complainants' Exhibit No. 28. — Paper writing, referred to by Harriet M. Woodbury (put in evidence, p. 618, vol. 1) . . 11

Complainants' Exhibit No. 29. — Copy of letter from Joel Giles to the Commissioner of Patents, dated May 28, 1846 (put in evidence, p. 619, vol. 1) 11

Complainants' Exhibit No. 30. — Envelope with endorsement on it (put in evidence, p. 619, vol. 1) 12

Complainants' Exhibit No. 31. — Model (put in evidence, p. 737, vol. 1) . . . . . .

Complainants' Exhibit No. 32. — Piece of moulding (put in evidence, p. 788, vol. 1) . . . . . .

Complainants' Exhibit No. 33. — Piece of moulding (put in evidence, p. 789, vol. 1) . . . . . .
Complainants' Exhibit No. 34. — Piece of board (put in evidence, p. 790, vol. 1) . . . . . .
Complainants' Exhibit No. 35. — Piece of moulding (put in evidence, p. 790, vol. 1) . . . . . .
Complainants' Exhibit No. 36. — Piece of moulding (put in evidence, p. 792, vol. 1) . . . . . .
Complainants' Exhibit No. 37. — Piece of board (put in evidence, p. 792, vol. 1) . . . . . .
Complainants' Exhibit No. 38. — Piece of moulding (put in evidence, p. 793, vol. 1) . . . . . .
Complainants' Exhibit No. 39, } A piece of compound moulding
" " 39*a*. } (put in evidence, p. 793, vol. 1)
Complainants' Exhibit No. 40. — Piece of moulding (put in evidence, p. 794, vol. 1) . . . . . .
Complainants' Exhibit No. 41. — Three pieces of moulding (put in evidence, p. 794, vol. 1) . . . . . .
Complainants' Exhibit No. 42, } Two pieces of moulding (put in ev-
" " 43, } idence, p. 795, vol. 1) . .
Complainants' Exhibit No. 44. — Piece of board (put in evidence, p. 795, vol. 1) . . . . . .
Complainants' Exhibit 44*a*. — Letter and postscript from Joseph P. Woodbury to Samuel Cooper, Esq., Washington, D.C., dated at East Boston, Mass., February 27, 1854 (put in evidence, p. 893, vol. 1) 339
Complainants' Exhibit 45. — Letter from Samuel Cooper to Commissioner of Patents, dated Boston, March 18, 1854 (put in evidence p. 894, vol. 1) 340
Complainants' Exhibit 45*a*. — Letter from Commissioner of Patents to Joseph P. Woodbury, dated March 23, 1854 (put in evidence, p. 894, vol. 1) 341
Complainants' Exhibit 46. — Letter from Samuel Cooper to Commissioner of Patents, dated Boston, May 6, 1854 (put in evidence, p. 895, vol. 1) 342
Complainants' Exhibit 46*a*. — Letter from Commissioner of Patents to J. P. Woodbury, dated June 20, 1854 (put in evidence, p. 895, vol. 1) 342
Complainants' Exhibit 47. — Letter from Samuel Cooper to Com-

missioner of Patents, dated May (put in evidence, p. 896, vol. 1) 344

Complainants' Exhibit 47*a*. — Letter from Commissioner of Patents to Samuel Cooper, dated August 8, 1854 (put in evidence, p. 896, vol. 1) 345

Complainants' Exhibit 48. — Letter from Samuel Cooper to Commissioner of Patents, dated Boston, August 25, 1854 (put in evidence, p. 896, vol. 1) 345

Complainants' Exhibit 48*a*. — Letter from Samuel Cooper to Commissioner of Patents, dated Boston, June 15, 1854 (put in evidence, p. 897, vol. 1) 347

Complainants' Exhibit 48*b*. — Letter from the Acting Commissioner of Patents to Samuel Cooper, Esq., dated August 29, 1854 (put in evidence p. 897, vol. 1) 350

Complainants' Exhibit 49. — Letter from Samuel Cooper to the Commissioner of Patents, dated September 1 (put in evidence, p. 898, vol. 1) 351

Complainants' Exhibit 49*a*. — Letter from the Acting Commissioner of Patents to Samuel Cooper, dated September 6, 1854 (put in evidence, p. 898, vol. 1) 352

Complainants' Exhibit 50. — Letter from Samuel Cooper to the Commissioner of Patents (put in evidence p. 898, vol. 1) . . 353

Complainants' Exhibit 50*a*. — Letter from Samuel Cooper to the Commissioner of Patents (put in evidence, p. 899, vol. 1) . 353

Complainants' Exhibit 51. — Certified copy from the Patent Office of the United States of the file wrapper, and contents and drawings in the matter of the letters patent, granted to Joseph P. Woodbury, dated April 29, 1873, No. 138,462 for "Improvement in Planing Machines" (put in evidence, p. 879, vol. 1) 354

Defendant's Exhibit A. — Certified copy, from the Patent Office of the United States, of the file wrapper, contents and drawing in the matter of the application of Alfred Anson, filed August 16, 1843, for dressing and preparing sash stuff, &c. (put in evidence, p. 30, vol. 1) 12

Defendant's Exhibit B. — Machine built by Alfred Anson (put in evidence, p. 30, vol. 1) . . . . . .

Defendant's Exhibit C. — Model of cutter head (put in evidence, p. 40, vol. 1) . . . . . .

Defendant's Exhibit D. — Silver medal awarded by the American Institute of New York to A. Anson, for an excellent window-sash moulding machine, 1848 (put in evidence, p. 86, vol. 1)

Defendant's Exhibit E. — Book of accounts of the firm of Cole & Bates (put in evidence, p. 91, vol. 1) . . . . .

Defendant's Exhibit F. — Book referred to by Horace S. Gates (put in evidence, p. 137, vol. 1) . . . . . .

Defendant's Exhibit G. — Book referred to by Albert A. Bailey (put in evidence, p. 141, vol. 1) . . . . . .

Defendant's Exhibit H. — Book of accounts by Beriah S. Rathburn (put in evidence, p. 143, vol. 1) . . . . . .

Defendant's Exhibit Journal I. 1, " " " I. 2, " " Ledger I. } Books of account of Joshua W. Shepard, referred to by Frederic W. H. Rogers (put in evidence, p. 155, vol. 1) . .

Defendant's Exhibit J. — Model of the Anson machine (Exhibit B), (put in evidence, p. 163, vol. 1) . . . . . .

Defendant's Exhibit K. — Certified duplicate under the seal of the Patent Office of the United States of the model as it now is, which was filed September 9, 1843, in the matter of the application of Alfred Anson, filed August 16, 1843, with certified copy of the drawings of said application annexed thereto (put in evidence, p. 169, vol. 1) . . . . . .

Defendant's Exhibit L. — Model of the Reynolds machine (put in evidence, p. 170, vol. 1) . . . . . .

Defendant's Exhibit M. — Certified copy of the records of the Probate Court of Bristol County, R.I., of the application and appointment of Mary Reynolds and Joseph Reynolds as administrators of the estate of Greenwood Reynolds, and of the settlement of said estate by said court (put in evidence, p. 171, vol. 1) 20

Defendant's Exhibit N. — Certified copy of two affidavits of Joseph Reynolds, filed in the suit of Nathan Mason *et al.* *v.* Tallman and Bucklin (put in evidence, p. 177, vol. 1) . . . 22

Defendant's Exhibit O. — Certified copy of the affidavit of Ellery Allen, in the suit of Mason *v.* Tallman and Bucklin (put in evidence, p. 268, vol. 1) 25

Defendant's Exhibit P. — Certified copy of the affidavit of William Tallman and James C. Bucklin, in the suit of Mason *v.* Tallman and Bucklin (put in evidence, p. 272, vol. 1) . . 26

Defendant's Exhibit Q. — Bill of lumber, mouldings, &c., sold to Moulton & Ingraham by Tallman and Bucklin, in the year 1845 (put in evidence, p. 276, vol. 1) 28

Defendant's Exhibit R 1, " " R 2. } Two sheets of drawings, referred to by James C. Bucklin (put in evidence, p. 278, vol. 1) . . . .

Defendant's Exhibit S. — Drawing referred to by James C. Bucklin (put in evidence, p. 279, vol. 1) . . . . . .

Defendant's Exhibit T. — Account book produced by Robinson Munroe (put in evidence, p. 295, vol. 1) . . . . . .

Defendant's Exhibit U. — Certified copy of the affidavit of Albert G. Sprague on petition for injunction in the suit of Mason *et al. v.* Tallman and Bucklin (put in evidence, p. 344, vol. 1) 30

Defendant's Exhibit V. — Certified copy of the affidavit of Albert G. Sprague, on petition for commitment on the suit of Mason *v.* Tallman and Bucklin (put in evidence, p. 346, vol. 1) . 32

Defendant's Exhibit W. — Certified copy of affidavit of Albert G. Sprague, in the suit of Mason *v.* Tallman and Bucklin (put in evidence, p. 346, vol. 1) 34

Defendant's Exhibit X. — Certified copy of affidavit of Arnold Peters in the suit of Mason *v.* Tallman and Bucklin (put in evidence, p. 353, vol. 1) 37

Defendant's Exhibit Y. — Certified copy, from the Patent Office of the United States, of the file wrapper, contents and drawing in the matter of the application of Joseph P. Woodbury, filed June 3, 1848, for "Improvement for holding down plank for planing" (put in evidence, p. 362, vol. 1) 39

Defendant's Exhibit Z. — Certified copy of the letters patent of the United States, No. 406, granted to James McGregor, Jr., dated August 28, 1833, for "Machine for joining, tonguing, grooving plank, and planing plank for flooring houses" (put in evidence, p. 362, vol. 1) 47

Defendant's Exhibit Az. — Certified copy of the letters patent of the United States, No. 768, granted to William Thorne and James Thorne, Jr., dated June 7, 1838, for "Improvement in machine for shaving shingles" (put in evidence, p. 362, vol. 1) 54

Defendant's Exhibit Ay. — Certified copy of the letters patent of the United States, No. 317, granted George L. Day, July 29, 1837, for "Improvement for dressing or smoothing sawed shingles," &c. (put in evidence, p. 362, vol. 1) . . . 60

Defendant's Exhibit Ax. — Certified copy of the letters patent of the United States, No. 6523, granted to Reuben Murdock, dated June 12, 1849, for "Improvement in barrel machinery" (put in evidence, p. 362, vol. 1) 63

Defendant's Exhibit Aw. — Certified copy of the letters patent of the United States, No. 5792, granted to Harvey Law, dated September 19, 1848, for "Improvement in machinery for planing rived staves" (put in evidence, p. 362, vol. 1) . . . 72

Defendant's Exhibit Av. — Certified copy of the letters patent of the United States, No. 5472, granted Ebenezer Wilson, dated March 14, 1848, for "Improvement in machinery for dressing combs" (put in evidence, p. 362, vol. 1) . . . 78

Defendant's Exhibit Au. — Certified copy of the file-wrapper and contents in the matter of the letters patent of the United States, No. 5472, granted Ebenezer Wilson, dated March 14, 1848, for "Improvement in machinery for dressing combs" (put in evidence, p. 363, vol. 1) 81

Defendant's Exhibit At. — Certified duplicate, from the Patent Office of the United States, of the model in the matter of the said letters patent last above named (put in evidence, p. 363, vol. 1)

Defendant's Exhibit As. — Certified copy of the letters patent of the United States, No. 6211, granted Joseph P. Woodbury, dated March 20, 1849, for "Improvement in planing machines" (put in evidence, p. 363, vol. 1) 91

Defendant's Exhibit Ar. — Certified copy of the letters patent of the United States, granted Benjamin Redheffer and William Redheffer, dated May 26, 1834, for "Improvement in comb-making" (put in evidence, p. 363. vol. 1) 96

Defendant's Exhibit Aq. — Certified duplicate, from the Patent Office of the United States, of the model in the matter of the last-named patent (put in evidence, p. 363, vol. 1) . . .

Defendant's Exhibit Ap. — Certified copy of the re-issue letters patent of the United States, No. 71, granted William W. Woodworth, in trust for the heirs at law of William Woodworth, dated July 8, 1845, for "Improvement in machines for plan-

ing, tonguing, grooving and dressing boards," &c., &c. (put in evidence, p. 363, vol. 1) 99

Defendant's Exhibit Ao. — Certified copy of the letters patent of the United States granted William Woodworth, dated December 27, 1828, for "Improvement in the method of planing, tonguing, grooving and cutting into mouldings," &c., &c. (put in evidence, p. 363, vol. 1) 107

Defendant's Exhibit An. — Certified copy, from the Patent Office of the United States, of the drawing made August 29, 1839, under the direction of the Commissioner of Patents, in conformity with the act of March 3, 1837, in the matter of the letters patent granted William Woodworth, dated December 27, 1828, for planing machine (put in evidence, p. 363, vol. 1) .

Defendant's Exhibit Am. — Certified copy, from the Patent Office of the United States, of a drawing filed November 14, 1842, in the matter of the letters patent granted William Woodworth, dated December 27, 1828, for planing machine (put in evidence, p. 363, vol. 1) . . . . . .

Defendant's Exhibit Ak. — Certified copy of the letters patent of the United States, No. 1244, granted to James H. Hutchinson, dated July 16, 1839, for "Improvement in machine for planing lumber" (put in evidence, p. 364, vol. 1) . . . 111

Defendant's Exhibit Aj. — Certified copy of the letters patent of the United States, No. 4225, granted Benjamin Brown, dated October 9, 1845, for "Improvement in planing machine" (put in evidence, p. 364, vol. 1) 116

Defendant's Exhibit Ai. — Certified copy of the letters patent of the United States, No. 5575, granted Alfred T. Serrell, dated May 16, 1848, for "Improvement in machinery for making mouldings" (put in evidence, p. 364, vol. 1) . . . 120

Defendant's Exhibit Ah. — Certified copy of the letters patent of the United States, No. 4283, granted Joseph E. Andrews, November 21, 1845, for "Improvement in planing machines" (put in evidence, p. 364, vol. 1) 127

Defendant's Exhibit Ag. — Certified copy of the letters patent of the United States, No. 3704, granted Charles W. Brown, dated August 14, 1844, for "Improvement for tonguing and grooving machines" (put in evidence, p. 364, vol. 1) . . . 133

Defendant's Exhibit Af. — Certified United States Patent Office copy,

from the library of the Patent Office, under the seal of the Commissioner of Patents, of the English letters patent No. 7926, granted to William Hickling Burnett, dated January 8, 1839, for improved machinery for planing, sawing and grooving, &c., &c. (put in evidence, p. 364, vol. 1) . . . 140

Defendant's Exhibit Ae. — Certified copy of the letters patent granted by the Kingdom of France, No. 2079, to M. Roguin, dated March 15, 1817 (put in evidence, p. 364, vol. 1). — [*For translation of the above, see Exhibit Cq.*]

Defendant's Exhibit Ad. — Certified copy of the certificate of addition to the last-named patent, dated March 30, 1818 (put in evidence, p. 364, vol. 1). — [*For translation of the above-named addition, see Exhibit Cp.*]

Defendant's Exhibit Ac. — Certified copy, from the Patent Office of the United States, of the specification and drawing in the matter of the application of Joseph E. Andrews, filed July 27, 1846, for "planing machine" (put in evidence, p. 365, vol. 1) 170

Defendant's Exhibit Ab. — Certified copy, from the Patent Office of the United States, of the petition, oath, specification and drawing in the matter of the application of Joseph P. Woodbury, filed February 15, 1856, for "Improvement in tonguing and grooving machines" (put in evidence, p. 365, vol. 1) . 173

Defendant's Exhibit Bz. — Certified copy of the bill in equity in the case of Nathan Mason *et al. v.* Tallman & Bucklin, filed in the Circuit Court of the United States in the District of Rhode Island, June 19, 1850 (put in evidence, p. 365, vol. 1) . 178

Defendant's Exhibit By. — Certified copy of the final decree in the case of Nathan Mason *et al. v.* Tallman & Bucklin, above mentioned (put in evidence, p. 365, vol. 1) 189

Defendant's Exhibit Bx. — Certified copy of motion for commitment for contempt in the case of Nathan Mason *et al. v.* Tallman & Bucklin, above mentioned (put in evidence, p. 365, vol. 1) 191

Defendant's Exhibit Bw. — Certified copy of the opinion of the court on the motion for commitment for contempt in the case of Mason *et al. v.* Tallman & Bucklin, as above mentioned (put in evidence, p. 365, vol. 1) 193

Defendant's Exhibit Bv. — Sheet of cuts of planing machines introduced by S. A. Woods (put in evidence, p. 373) . . .

Defendant's Exhibit Bu. — Specifications and drawings of the patent, granted to Solomon S. Gray, No. 11,582, dated August 22, 1854 (put in evidence, p. 374, vol. 1) 198

Defendant's Exhibit Bt. — Certified copy of the re-issued letters patent of the United States, No. 945, granted to Solomon S. Gray, S. A. Woods, dated April 17, 1860 (put in evidence, p. 374, vol. 1) 201

Defendant's Exhibit Bs. — Certified copy of the letters patent of the United States, No. 26,902, granted to Solomon S. Gray and S. A. Woods, dated January 24, 1860, "Improved planing machine" (put in evidence, p. 374, vol. 1) 206

Defendant's Exhibit Br. — Postal card sent to Charles Baker, Esq., Worcester, Mass., by the Woodbury Patent Planing Machine Company, dated August 7, 1875 (put in evidence, p. 386, vol. 1) 211

Defendant's Exhibit Bq. — Copy of the Supplement of the "Boston Daily Globe," Monday morning, November 29, 1875 (put in evidence, p. 389, vol. 1) 212

Defendant's Exhibit Bp. — Certified copy, under the Great Seal of Connecticut, of the certificate of incorporation of the Woodbury Patent Planing Machine Company (put in evidence, p. 416, vol. 1) 248

Defendant's Exhibit Bo. — Certified copy, from the Patent Office of the United States, of the affidavit of Joseph P. Woodbury in the matter of the application for extension of letters patent granted Joseph E. Andrews, dated November 21, 1845, No. 4283, for "Planing and jointing machines" (put in evidence, p. 417, vol. 1) 250

Defendant's Exhibit Bn.—Certified copy of deed of Samuel Hall to Joseph P. and James A. Woodbury, dated January 14, 1846, of land in East Boston (put in evidence, p. 417, vol. 1) . 252

Defendant's Exhibit Bm. — Certified copy of mortgage and of same property from Joseph P. and James A. Woodbury to Samuel Hall and Edward H. Delano, and a certified copy of the discharge of said mortgage by said Delano and the North American Insurance Company, assignee of Samuel Hall (put in evidence, p. 417, vol. 1) 255

Defendant's Exhibit Bk. — Certified copy of the assignment by said Hall of his interest in the above mortgage to the North American Insurance Company (put in evidence, p. 417, vol. 1) . 258

Defendant's Exhibit Bj. — Certified copy of the transfer of a mortgage on the above premises from Samuel Hall to the East Boston Company, made to Joseph P. Woodbury by the said East Boston Company, February 28, 1850 (put in evidence, p. 417, vol. 1) 260

Defendant's Exhibit Bi. — Certified copy of warranty deed, James A. Woodbury to Joseph P. Woodbury, of all his interests in the above premises, dated February 25, 1851 (put in evidence, p. 417, vol. 1) 261

Defendant's Exhibit Bh. — Certified copy of mortgage, and discharge of same, made by James A. Woodbury to Joseph P. Woodbury upon his undivided interests in said premises, November 15, 1849 (put in evidence, p. 417, vol. 1) . . . 264

Defendant's Exhibit Bg. — Certified copy of deed of Nathaniel Hamblin to Joseph P. and James A Woodbury, of real estate in East Boston, dated January 1, 1847 (put in evidence, p. 418, vol. 1) 266

Defendant's Exhibit Bf. — Certified copy of a deed from William Heath to Joseph P. and James A. Woodbury, of land in East Boston, dated June 14, 1847 (put in evidence, p. 418, vol. 1) 268

Defendant's Exhibit Be. — Certified copy of a grant of an easement in a well for the use of the steam mill of Joseph P. and James A. Woodbury, made to them by Tobias Cook, July 28, 1846 (put in evidence, p. 418, vol. 1) 271

Defendant's Exhibit Bd. — Certified copy of mortgage, and discharge of same, made by Joseph P. and James A. Woodbury to Amos Hill, Jr., and Henry Y. Hill, of land in East Boston, dated May 27, 1848, discharged March 4, 1851 (put in evidence, p. 418, vol. 1) 273

Defendant's Exhibit Bc. — Certified copy of release of Nathaniel Hamblin to Joseph P. and James A. Woodbury, of all incumbrances or conditions held by him on land in East Boston, deeded to them January 1, 1847, by him, which release is dated June 16, 1847 (put in evidence, p. 418, vol. 1) . . 276

Defendant's Exhibit Cz. — Certified copy of warranty deed of land in East Boston, by James H. West to Joseph P. and James A. Woodbury, dated December 17, 1846 (put in evidence, p. 418, vol. 1) 278

Defendant's Exhibit Cy. — Certified copy of lease and agreement

made between Joseph P. Woodbury and Asa Sawyer, Jr., in relation to the mill and property of said Joseph P. Woodbury, on Border street, East Boston, and in relation to the exhibition and promoting of the sale of the said Joseph P. Woodbury's patent stationary knife-planing machines by the said Sawyer, said agreement and lease being dated July 14, 1851 (put in evidence, p. 419, vol. 1) 280

Defendant's Exhibit Cy. — Certified copy of the letters patent of the United States, No. 64,821, granted Joseph P. Woodbury, dated May 14, 1867, for "Improved locomotive truck and engine" (put in evidence, p. 425, vol. 1) 284

Defendant's Exhibit Cx. — Certified copy of the letters patent of the United States, No. 35,193, granted Joseph P. Woodbury, May 6, 1862, for "Improvement in arming war vessels" (put in evidence p. 425, vol. 1) 291

Defendant's Exhibit Cw. — Certified copy of the letters patent of the United States, No. 94,461, granted Joseph Page Woodbury, dated August 31, 1869, for "Improvement in railway freight cars" (put in evidence, p. 425, vol. 1) 299

Defendant's Exhibit Cv. — Certified copy of the letters patent of the United States, No. 35,965, granted Joseph P. Woodbury and Solomon S. Gray, dated July 22, 1862, for "Improvement in sabot for feathered projectiles" (put in evidence, p. 426, vol. 1) 303

Defendant's Exhibit Cu. — Certified copy of the letters patent of the United States, No. 41,802, granted Joseph P. Woodbury, dated March 1, 1864, for "Improved construction of war vessels" (put in evidence, p. 426, vol 1) 307

Defendant's Exhibit Ct. — Certified copy of the letters patent of the United States, No. 46,043, granted to Joseph P. Woodbury, January 24, 1865, for "Improvement in street steam railway cars" (put in evidence, p. 426, vol. 1) 312

Defendant's Exhibit Cs. — Certified copy of the letters patent of the United States, No. 41,883, granted Woodbury and Ames, dated March 8, 1864, for "Improvement in automatic railroad switch" (put in evidence, p. 426, vol. 1) 320

Defendant's Exhibit Cr. — Certified copy of the letters patent of the United States, No. 11,984, granted James A. Woodbury, dated November 21, 1854, for "Pressure bar for planing machines" (put in evidence, p. 426, vol. 1) 325

Defendant's Exhibit Cq. — Translation by Max Auerbach of the French letters patent granted M. Roguin, March 15, 1817, by the Kingdom of France (put in evidence, p. 427, vol. 1) 328

Defendant's Exhibit Cp. — Translation of the certificate of addition to the letters patent, granted M. Roguin, above referred to, March 30, 1818 (put in evidence, p. 427, vol. 1) . . 334

Defendant's Exhibit Co. — Model (put in evidence, p. 445, vol. 1)

" " Cn. — Model (put in evidence, p. 445, vol. 1)

" " Cm. — } Holding-down device (put in evidence,
" " Ck. — } p. 452, vol. 1.) . . . .

" " Cj. — Board (put in evidence, p. 452) . .

" " Ci. — " (" " p. 452) . .

" " Ch. — " (" " p. 452) . .

" " Cg. — " (" " p. 452) . .

" " Cf. — " (" " p. 452) . .

Defendant's Exhibit Ce. — Notice of a meeting of the Boston Association of Planers, dated April 2, 1859 (put in evidence, p. 442, vol. 1) 338

Defendant's Exhibit Cd. — Notice of a meeting of the Boston Association of Planers, dated May 2, 1859 (put in evidence, p. 442, vol. 1) 338

Defendant's Exhibit Dz. — Piece of moulding (put in evidence, p. 556, vol. 1) . . . . . .

Defendant's Exhibit Dy. — Piece of moulding (put in evidence, p. 910, vol. 1) . . . . . .

Defendant's Exhibit Dx. — Piece of moulding (put in evidence, p. 912, vol. 1) . . . . . .

Defendants Exhibit Dw. — Cutter-head knife (put in evidence, p. 913, vol. 1) . . . . . .

Defendant's Exhibit Dv. — Cutter-head knife (put in evidence, p. 913, vol. 1) . . . . . .

Defendant's Exhibit Du. — Cutter-head knife (put in evidence, p. 913, vol. 1) . . . . . .

Defendant's Exhibit Dt. — Piece of moulding (put in evidence, p. 916, vol. 1) . . . . . .

Defendant's Exhibit Ds. — Piece of moulding (put in evidence, p. 916, vol. 1) . . . . . .

Defendant's Exhibit Dr. — Piece of moulding (put in evidence, p. 917, vol. 1) . . . . . .

Defendant's Exhibit Dp. — Cutter-head knife (put in evidence, p. 928, vol. 1) . . . . . .
Defendant's Exhibit Dq. — Piece of moulding (put in evidence, p. 941, vol. 1) . . . . . .
Defendant's Exhibit Do. — Board (put in evidence, p. 953, vol. 1).
" " Dn. — " (" " " p. 953, vol. 1).
" " Dm. — " (" " " p. 953, vol. 1).
" " Dk. — " (" " " p. 953, vol. 1.)
" " Dj. — " (" " " p. 953, vol. 1).

Circuit Court of the United States,

DISTRICT OF MASSACHUSETTS.

IN EQUITY.

No. 646.

WOODBURY PATENT PLANING MACHINE CO.

v.

ALLEN W. KEITH.

EXHIBITS.

EXHIBIT No. 1.—G.A.O.E., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 138,462, DATED APRIL 29, 1873.

[PUT IN EVIDENCE, PAGE 17, VOL. 1.]

UNITED STATES OF AMERICA.

To all to whom these presents shall come:

Whereas Joseph P. Woodbury, of Boston, Massachusetts has presented to the Commissioner of Patents a petition praying for the grant of Letters Patent for an alleged new and useful Improvement in Planing-Machines, a description of which invention is contained in the Specification of which a copy is hereunto annexed and made a part

hereof, and has complied with the various requirements of Law in such cases made and provided; and

Whereas upon due examination made the said Claimant is adjudged to be justly entitled to a Patent under the Law;

Now therefore these Letters Patent are to grant unto the said Joseph P. Woodbury, his heirs or assigns, for the term of seventeen years from the twenty ninth day of April one thousand eight hundred and seventy three the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this twenty ninth day of April in the year of ou
[L.S.] Lord one thousand eight hundred and seventy-three and of the Independence of the United States of America the ninety-seventh.

C. DELANO,
Secretary of the Interior.

Countersigned:
M. D. LEGGETT,
Commissioner of Patents.

SPECIFICATION.

LETTERS PATENT NO. 138,462, GRANTED JOSEPH P. WOODBURY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PLANING MACHINES.

Specification forming part of [Letters Patent No. 138,462, dated April 29, 1873; application filed December 5, 1870.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Planing-Machines, of which the following is a specification:

The object of my present improvement in planing-machines is to present the material to the cutter in such a manner as both to counteract, as far as practicable, the "fluttering" or tremor caused by the successive blows of the knives, and the consequent wavy and uneven surface of the planed work, and at the same time to overcome more perfectly than heretofore the tendency in the knives of the rotary cutter to loosen and dislodge the knots and "shakes," and to tear the fibers of the wood irregularly, instead of severing them smoothly along the exact surface desired. To effect this two-fold object I make use of a device which I style a "yielding pressure-bar," which possesses the following characteristics, viz.: It is made of such material, and has such mass as to be rigid from end to end; its under face is made flat, so that it has an extended bearing upon the work longitudinally of the machine; and it is mounted upon springs so as, within certain limits, to accommodate itself to the varying inequalities in the surface of the material being operated on. A pressure-bar thus constructed and mounted differs from a pressure-roller for holding down material in planing-machines in the following essential particulars: First, there is less liability to become coated with the gums of the wood; second, there is no danger, as with the roller, that chips and other small fragments will be caught under it and pressed down into the planed surface of the wood; third, by reason of its extended bearing, it is more efficient to check the tremulous motion of the material under the rapid and powerful blows of the knives than the roller, the form of which is such that its bearing upon the work is necessarily along a single line only; and, fourth, the bar can be made to exert its pressure at points much nearer to the edge of the knives than would be attainable with the roller. This last point of difference is one of great practical importance. As the knives cut toward the unplained portion of the stock, a large part of their work being performed during their ascent, there is a constant tendency for them to unseat the knots and tear out the shakes and the loose and irregular fibers of the wood; hence the great desirability of bringing a strong pressure to bear in immediate proximity to the line along which the knives are operating—

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Whereas upon due examination made the said Claimant is adjudged to be justly entitled to a Patent under the Law;

Now therefore these Letters Patent are to grant unto the said Joseph P. Woodbury, his heirs or assigns, for the term of seventeen years from the twenty ninth day of April one thousand eight hundred and seventy three the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this twenty ninth day of April in the year of ou
[L.S.] Lord one thousand eight hundred and seventy-three and of the Independence of the United States of America the ninety-seventh.

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a result which is impossible when the roller is used, but with the bar is entirely feasible.

Besides the pressure-roller for holding down material in planing-machines, I am aware that it is proposed, in the English patent of Burnett of 1839, to make use of a flat spring arranged transversely of the machine, and supported along its upper edge upon a bar which has a vertical adjustability. One essential difference between such a device and my pressure-bar is found in the fact that the latter is perfectly rigid from end to end, from which it results that, when the knives begin to lift a knot or shake or sliver, the entire force of the springs that support the bar is concentrated at the special point thus threatened, and thereby holds the weakened part in place. In like manner this element of rigidity in the bar causes the entire strength of the springs to be concentrated upon any warp that may occur in one edge or in the middle of the material, which is thus reduced to a true bearing on the bed or the carriage of the machine. A flat pressure-spring, on the other hand, having the same elasticity in all directions, will yield transversely of the work as well as in a vertical direction, and, as a consequence, only a small part of its power can be brought to bear at a particular point, as with the stiff bar, to force the warped material to a true bearing on the machine or to counteract the tendency of the cutter to tear out the knots and other weak parts. Another difference between the bar and the spring is, that the bearing of the latter upon the work, as in the case of the pressure-roller, is only a line.

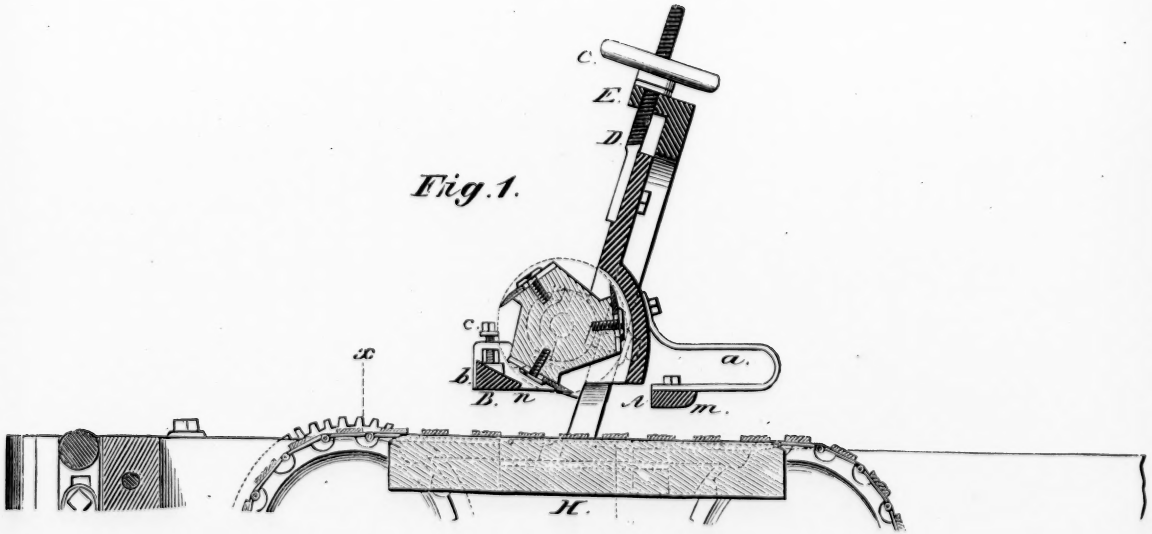
The mode in which I apply my invention is fully illustrated in the accompanying drawing, in which —

Figure 1 represents a longitudinal vertical section of a planing-machine through the line *y y* of Fig. 2. Fig. 2 is a plan view of the machine. Fig. 3 represents a transverse vertical section on the line *x x* of Fig. 1.

As my present invention has nothing to do with the frame-work of the machine or with the parts specially designed for receiving and transmitting the power, these parts do not require to be described.

A represents one of my yielding pressure-bars, which is shown in the drawing as set off at some distance from the path of the knives;

Fig. 1.



but this is done in order to show it more distinctly. In practice it is to be brought much nearer to the cutter, leaving only sufficient space between it and the path of the knives to give it the requisite vertical play to enable it to conform to the irregularities of the stuff which is being planed. As this bar is specially designed to hold down the unplaned part of the material, it is provided with a spring at each end, here marked *a a*, some such compensating device being essential to the successful working of a bar occupying this position, by reason of the varying thickness of the rough stock. When, however, the bar is used to hold down the planed part of the stuff, inasmuch as the thickness of this portion has been reduced by the action of the cutter to an approximate uniformity, the springs may be dispensed with, and the bar supported at the end of two arms extending out from the cutter-frame. The elasticity of the metal composing these arms will ordinarily be sufficient to compensate for any actual variation from absolute uniformity of thickness in the planed material. B represents a pressure-bar of this description supported on the arms *b b*. These arms, as well as the springs *a a* that support the bar A, are shown as attached to the frame that carries the cutter, from which it follows that both these bars will receive the same vertical adjustment as the cutter, and simultaneously with it, which is effected by means of the hand-nut C and the threaded rod D passing up through the arm E. The bar B is made capable of a separate vertical adjustment by means of the screws *c c*.

In order to facilitate the entrance of the work beneath the bars, one of the lower edges of each bar is slightly beveled or rounded, as shown at *m* and *n*.

Directly underneath the cutter is the traveling bed or apron, which rests upon the solid and unyielding bed-plate H, which is designed to act as an anvil just under the point where the successive blows of the knives are delivered upon the material subjected to their action, and which is so constructed as effectually to resist the springing or yielding of the material in a downward direction. This bed-plate is extended far enough in front and in rear of the cutter to serve as a firm support under the pressure-bars A and B.

The stuff is carried forward to the cutter by means of an endless

apron revolving upon suitable shafts or rollers. This apron is composed of two or more endless belts or chains, to which are attached transverse slats or bars of metal. The bed-plate is cut away at the points where these belts or chains pass over it, so that the transverse metal slats as they are carried across the face of the bed-plate, may be in direct contact therewith.

What I claim as my invention is —

1. The combination of a rotary cutter and a yielding pressure-bar or bars, substantially as and for the purpose described.

2. The combination of a solid bed and a yielding pressure-bar or bars, for the purpose of holding down the material while being acted on by the cutter, substantially as set forth.

3. The combination of a solid bed, a rotary cutter, and a yielding pressure bar or bars, substantially as described.

4. The combination of the two pressure-bars, one of which is supported upon arms, and the other upon springs, substantially as and for the purpose set forth.

JOSEPH P. WOODBURY.

Witnesses:

FRANK G. PARKER,
WILLIAM EDSON.

EXHIBIT NO. 2. — G.A.O.E., Special Examiner.

ASSIGNMENT OF JOSEPH P. WOODBURY OF LETTERS PATENT NO. 138,462 TO THE WOODBURY PATENT PLANING MACHINE COMPANY.

[PUT IN EVIDENCE, PAGE 18, VOL. 1.]

THE U.S. PATENT OFFICE.

To all persons to whom these presents shall come, GREETING:

This is to certify that the annexed is a true copy from the Rec-

ords of this Office of an Assignment Recorded in Liber P[17] Page 305.

In testimony whereof, I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this Twelfth day of February, in the year of our Lord one thousand eight hundred and seventy-six, and of the Independence of the United States the one hundredth.

[SEAL]

ELLIS SPEAR,
Acting Commissioner.

P[17] p. 305.

Whereas Joseph P. Woodbury of Boston, Massachusetts, has duly obtained Letters Patent, of the United States of America, dated April twenty ninth eighteen hundred and seventy three, numbered 138,462, for an "Improvement in Planing Machines," and whereas a joint stock company has been duly organized under the laws of the State of Connecticut, and established at the City of Hartford in said State, under the corporate name of "The Woodbury Patent Planing Machine Company": and whereas it has been agreed by and between said company and said Woodbury that said Letters Patent shall be assigned to said Company; now therefore, in consideration of the premises and of one dollar paid by said company to said Woodbury, and for other good and adequate considerations received, the said Joseph P. Woodbury hereby sells, assigns, grants and conveys his said Letters Patent, with all the rights and interests thereby granted and secured or intended so to be, unto the said "The Woodbury Patent Planing Machine Company," and its successors and assignees, for their sole use and benefit, for the full term of said patent, namely seventeen years from the twenty ninth day of April, eighteen hundred and seventy-three, and no longer, also the full right, power, and authority to demand and recover to their own use, but at their own expense all unpaid patent, rents, profits and damages for the use of said patented "Improvement" since the date of said patent, which can be collected by legal process, or otherwise as may be needful.

In Witness whereof the said Joseph P. Woodbury has duly

executed and delivered these presents to said company the second day of March in the year eighteen hundred and seventy-four by his hand and seal.

Witnesses: JOSEPH P. WOODBURY. [L.S.]

WALDRIN H. RAND.
SIDNEY C. BANCROFT.

Recorded
Mar. 7, 1874.
Ex'd F.F.

EXHIBIT No. 3.—G.A.O.E., Special Examiner.

[PUT IN EVIDENCE, PAGE 24, VOL. 1.]

Branch Office of the
WOODBURY PATENT PLANING MACHINE COMPANY,
Organized under the laws of Connecticut,
Owners of the Patent granted to Joseph P. Woodbury, April 29th, 1873,
No. 5 Pemberton Square,

BOSTON, Mass., Nov 22nd 1875

To Allen W. Keith, Malden, Mass.

Information having reached this office that the Improvement in Planing Machines, invented by Joseph P. Woodbury, secured by Letters Patent dated April 29th, 1873, and numbered 138,462, is now being used by you at your establishment in Malden, County of Middlesex, Mass., without any license from said Woodbury, or from this Company which now owns the Patent, the Company now requests you to pay the royalty and damages from April 29th, 1873, to the present time, and to either desist from the use of said invention after this notice, or procure a license, which the Company offers to grant upon its usual terms and conditions. Your refusal or neglect to comply with said request will be deemed by the Company as indicating your intention to wilfully infringe upon its rights, which the Company will maintain and prosecute to the extent of the law, unless the matter be adjusted.

Please inform the Company immediately of your conclusion in the matter.

Yours respectfully,

L. A. BIGELOW, *Treasurer.*
WALDRON H. RAND, *Secretary.*

Nov. 22nd, 1875.

I, W. H. Nash, Agent of the Woodbury Patent Planing Machine Company, hereby certify that I served the within notice upon Allen W. Keith of Malden, Mass., by delivering him a copy thereof in hand, in Malden, Mass., this Twenty Second day of November, 1875.

W. H. NASH *Agent.*

COMPLAINANT'S EXHIBIT 15.—D.B.H., Special Examiner.

[PUT IN EVIDENCE, PAGE 476, VOL. 1.]

SAMUEL E. BROWN.

May the 19, 1875.

SAML. BROWN, in acc. with Jones Mfg. Co.

DR.				CR.			
June 30	To Postage	0 05		May 30	By 20 days Morgt		30 00
	" Balance	50 57		June "	" 13³ x do		20 62
		50 62					50 62

E. E. JONES MFG. CO.
Templeton, June 30, 1846. By Harris.

COMPLAINANT'S EXHIBIT 27.—D.B.H., Special Examiner.

COPY OF JOSEPH P. WOODBURY'S CAVEAT FOR PLANING MACHINE, DATED MAY 28, 1846.

[PUT IN EVIDENCE, PAGE 617, VOL. 1.]

To the Commissioner of Patents:

The petition of Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, Respectfully Represents:—

That he has made certain improvements in rotary planing and reducing machines; and that he is now engaged in making experiments for the purpose of perfecting the same, preparatory to his applying for letters patent therefor. He therefore prays that the subjoined description of his invention may be filed as a Caveat, in the confidential archives of the Patent Office, agreeably to the provisions of the Act of Congress in that case made and provided; he having paid twenty dollars into the Treasury of the United States, and otherwise complied with the requirements of the said act.

BOSTON, May 28th A.D. 1846.

My invention is an improvement upon the Andrews planing machine, so called, for which the United States granted to Joseph E. Andrews of Boston, a patent, dated November 21, 1845, to which I refer for a general description of the machine improved by me. I use the frame, drums, pullies, &c, the cutter wheel, and the revolving platform of the Andrews machine — but I dispense with the endless aprons above the revolving platform — and instead thereof I use flat pressure bars, which produce a dead pressure upon the board, as it is carried under the cutting cylinder, and through the machine. These flat iron bars are brought much nearer to the cutting line of the planing cylinder, than any other device can be, and they hold the board upon the revolving platform with sufficient firmness to feed it through the machine, and at the same time, by their flat dead pressure, they hold the board perfectly in a line, and effectually prevent all tremor and fluttering in the board. The bruising of the surface and texture of the board produced by pressure rollers in other machines is entirely got rid of and a surface greatly improved in finish over the work of all other machines, is obtained. I claim as my first improvement, the *combination* of the cutter wheel, and the revolving platform of the Andrews machine, and the flat pressure bars above described, for the purpose of planing and reducing boards and other materials to a thickness.

I also construct of circular saws wheels for tonguing and grooving

the boards, and I claim the combination of such wheels with the above mentioned combined apparatus for planing.

(Copy) JOSEPH P. WOODBURY.

[Endorsed on back of the above as follows:]
Copy of
Joseph P. Woodbury's Caveat
for a planing machine,
May 28, 1846.

COMPLAINANT'S EXHIBIT 28. — D.B.H., Special Examiner.

[PUT IN EVIDENCE, PAGE 618, VOL. 1.]

Joseph P. Woodbury's Caveat for the combination of pressure bars with the rotary cutter was dated May 28th, 1846, and the letter, enclosing the same, directed to the Patent Office, bore the same date; a copy of which is in the handwriting of the Hon. Joel Giles.

Joseph P. Woodbury's Caveat for the combination of pressure bars with the stationary cutters was dated June 3d, 1846, and mailed that day.

COMPLAINANT'S EXHIBIT 29. — D.B.H., Special Examiner.

COPY OF LETTER FROM JOEL GILES TO COMMISSIONER OF PATENTS, DATED MAY 28, 1848.

[PUT IN EVIDENCE, PAGE 619, VOL. 1.]

(Copy.)

BOSTON, May 28th, 1846.

To the Commissioner of Patents:

Dear Sir, — I enclose Joseph P. Woodbury's Caveat for a planing machine to filed in your office, according to law — and twenty dollars. Please acknowledge the receipt of the same, and oblige —

Respectfully, JOEL GILES.

4 Court St.,
Boston.

[Endorsed on the above.] Copy of caveat for improvement on rotary cutter planing machine.—Copy.

To the Commissioner of Patents, Washington, D.C.

That he has made certain improvements in rotary planing and reducing machines; and that he is now engaged in making experiments for the purpose of perfecting the same, preparatory to his applying for letters patent therefor. He therefore prays that the subjoined description of his invention may be filed as a Caveat, in the confidential archives of the Patent Office, agreeably to the provisions of the Act of Congress in that case made and provided; he having paid twenty dollars into the Treasury of the United States, and otherwise complied with the requirements of the said act.

Boston, May 28th A.D. 1846.

My invention is an improvement upon the Andrews planing machine, so called, for which the United States granted to Joseph E. Andrews of Boston, a patent, dated November 21, 1845, to which I refer for a general description of the machine improved by me. I use the frame, drums, pullies, &c, the cutter wheel, and the revolving platform of the Andrews machine — but I dispense with the endless aprons above the revolving platform — and instead thereof I use flat pressure bars, which produce a dead pressure upon the board, as it is carried under the cutting cylinder, and through the machine. These flat iron bars are brought much nearer to the cutting line of the planing cylinder, than any other device can be, and they hold the board upon the revolving platform with sufficient firmness to feed it through the machine, and at the same time, by their flat dead pressure, they hold the board perfectly in a line, and effectually prevent all tremor and fluttering in the board. The bruising of the surface and texture of the board produced by pressure rollers in other machines is entirely got rid of and a surface greatly improved in finish over the work of all other machines, is obtained. I claim as my first improvement, the *combination* of the cutter wheel, and the revolving platform of the Andrews machine, and the flat pressure bars above described, for the purpose of planing and reducing boards and other materials to a thickness.

I also construct of circular saws wheels for tonguing and grooving

the boards, and I claim the combination of such wheels with the above mentioned combined apparatus for planing.

(Copy) JOSEPH P. WOODBURY.

[Endorsed on back of the above as follows:]
Copy of
Joseph P. Woodbury's Caveat
for a planing machine,
May 28, 1846.

COMPLAINANT'S EXHIBIT 28. — D.B.H., Special Examiner.

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COMPLAINANT'S EXHIBIT 29. — D.B.H., Special Examiner.

COPY OF LETTER FROM JOEL GILES TO COMMISSIONER OF PATENTS, DATED MAY 28, 1848.

[PUT IN EVIDENCE, PAGE 619, VOL. 1.]

(Copy.)

BOSTON, May 28th, 1846.

To the Commissioner of Patents:

Dear Sir, — I enclose Joseph P. Woodbury's Caveat for a planing machine to filed in your office, according to law — and twenty dollars. Please acknowledge the receipt of the same, and oblige —

Respectfully, JOEL GILES.

4 Court St.,
Boston.

[Endorsed on the above.] Copy of caveat for improvement on rotary cutter planing machine.—Copy.

To the Commissioner of Patents, Washington, D.C.

COMPLAINANT'S EXHIBIT 30.—D.B.H., Special Examiner.

OFFICIAL ENVELOPE WITH THE FOLLOWING ENDORSEMENT ON IT.

[PUT IN EVIDENCE, PAGE 619, VOL. 1.]

Copy of a Caveat dated May 28, 1846, Combination of Rotary Cutters and pressure bars, in the handwriting of Joel Giles, Esq.

DEFENDANT'S EXHIBIT A.—D.B.H., Special Examiner.

FILE WRAPPER AND CONTENTS IN THE MATTER OF THE APPLICATION OF ALFRED ANSON, FILED AUGUST 16, 1843.

[PUT IN EVIDENCE, PAGE 30, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these presents shall come, GREETING:

This is to certify that the annexed is a true copy from the Files of this Office of the File Wrapper, Contents and Drawing in the matter of the application of Alfred Anson, filed August 16th, 1843, for Dressing and Preparing Sash Stuff, &c.

In testimony whereof, I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be [SEAL] hereunto affixed this Second day of March, in the year of our Lord one thousand eight hundred and seventy-six, and of the Independence of the United States the one hundredth.

ELLIS SPEAR,
Acting Commissioner.

To the Commissioner of Patents:

The petition of Alfred Anson, of the town of Norwich, in the County of New London and State of Connecticut, respectfully

showeth: That your petitioner has invented a new, useful and valuable improvement, in the construction of the stocks of rotating cutters for dressing and cutting window sash stuff, &c, which he verily believes has not been known or used prior to the invention thereof, by your petitioner. He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and conditions of the Acts of Congress, in that case made and provided: he having paid thirty dollars into the Treasury, and complied with the other provisions of the said act — November 10, 1843.

ALFRED ANSON.

To all whom it may concern:

Be it known that I, Alfred Anson, of Norwich, in the County of New London, and State of Connecticut, have invented a new, useful and valuable improvement in the construction of the Stocks of rotating cutters, for dressing and cutting window sash stuff, &c.; and I do hereby declare that the following is a full and exact description of the said improvement, and the application of the same to machines for dressing and cutting stuff for window-sashes, &c , and the operation of the same, reference being had to the annexed drawings, numbered from 1 to 12, inclusive, showing a perspective view of the whole machine and detailed sections thereof.

To enable others skilled in the art, to make and use my invention, I deem it necessary to describe the entire machine for cutting sash, as well as the application of my improvement thereto, which I proceed describe referring to the drawings attached, lettered and numbered, viz.

Fig. 1st is a perspective view of the whole machine — and the operation is as follows: The stuff or timber, after being sawed to the required width and thickness, is made to pass through a box of the proper width under the cutters, whose edges are so set, that revolving, either singly or combined they form the sash stuff of the required pattern.

A, represents the cylinder or stock, which holds the cutters, the

revolving surface of which are turned off to correspond with the edge of the tools or cutters, and the pattern of the work.

Fig. 2d. represents an end view of the stock, shewing the manner in which the cutters are held — *a*, *a*, *a*, are caps, made to clasp the cutters *c*, *c*, *c*, by means of set-screws, holding them firmly to the stock *b*, *e*, *e*, *e*, are spaces cut out of the stock *b*, to allow the chips to pass off and the cutters to work freely.

Fig. 3d. represents a side view of the Stock, composed of two blocks upon a shaft, S, to which stock the knives or cutters as 1, 2, 3, are fastened, (by the caps *a*, *a*, *a*, in Fig 2,) the portion or block *f*, is stationary upon the shaft, *s*, and the block, *g*, can be shifted by means of a screw and nut, marked *n*, so as to admit cutters of different widths at 2, as may be required.

Fig. 4. represents a cylinder with knives *c*, *c*, *c*, attached, which may be placed in the machine, in lieu of the stock and sash cutters, and used for dressing or planing slats for window blinds, &c.

Fig. 5. presents an end view of the two upright posts or stanchions between which the stock and cutters revolve, which may be elevated or depressed by means of screws, at *n*, *n*, so as to admit the passage of such different thicknesses of stuff as may be required, the elevation or depression being effected by means of the shaft and crank marked *k*, *k*.

Fig. 6. is a view of the top of the machine, shewing the feeding box, the chain for carrying along the stuff, &c., which will be more particularly described in the description of the operation of the machine hereafter.

Fig. 7. represents the chain or feeder, composed of open links *a*, *a*, *a*, of round iron, connected by links *e*, *e*, *e*, of flat iron about 1¼ inches wide, some of which are perforated to admit a cross bar, when necessary.

Fig. 8. is one of the cross bars, fastened to the links of the chain Fig. 7, by a screw, S.

Fig. 9. represents the spur wheel, revolving in the front part of the machine, and intended to carry the feeder, by the matching of the cogs or spurs into the links of the chain represented by Fig. 7.

Fig. 10. a front view of the feed box, *h*, *h*, being the sides, *y*, a

cross bar attached to the chain, *l*, *l*, two plates of iron above which the bar passes, and the chain beneath; the neck of the bar, traversing the space between the plates. These bars are attached to the chain at distances corresponding with the required length of the stuff to be worked.

Figs. 11. and 12. represent the knives or cutters, and the stock to which they are attached, the cutter marked 2, being of various widths as may be required for the different styles of sash.

The following is the operation of the machine, reference being had to Figures 1 and 6, of the attached drawings: —

Fig. 1.

4. is the cylinder to which the power is applied by means of a strap, crank, or otherwise. The stuff, (sawed to a proper thickness) being placed in the box *h*, *h*, (which may be graduated to any required width) is carried along by the chain, *w*, being held by the cross bar, *y*, and passing under the cutters attached to the stock, *a*, passes out in front in a finished state, the strap marked *b*, carrying the revolving cutters, and the feeding chain and bars being moved by means of the chain *u*, and cog wheels *k*, 1, 3, 2, *g*, &c. — 5, being a wheel or pully for tightening the chain *u*.

x, is a shield of sheet iron or other material, for throwing off the chips — *t*, and *q*, are guides of cast iron, of a thickness corresponding with that of the thinnest stuff used or planed, designed to steady or guide the stuff during the operation of planing, and as it leaves the feed box, the guide *q*, being permanently fixed in a line with one side of the feed box, and the guide *t*, having attached to it a spring which presses it against the stuff keeping it in close contact with the guide, *q*. The stuff is also kept steady by means of a bar passing from the stands *m*, and *n*, which bar may be raised or depressed in the same manner and simultaneously with the shafts which hold the cutters by means of the screws in Fig. 5.

No claim for originality being urged for the general operation of the machine, or the gearing, it is considered unnecessary to give a minute description of all the detached portions of the machine, or their operation, sufficient explicitness being believed to be given to

cross bar attached to the chain, *l*, *l*, two plates of iron above which the bar passes, and the chain beneath; the neck of the bar, traversing the space between the plates. These bars are attached to the chain at distances corresponding with the required length of the stuff to be worked.

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Fig. 1.

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x, is a shield of sheet iron or other material, for throwing off the chips — *t*, and *q*, are guides of cast iron, of a thickness corresponding with that of the thinnest stuff used or planed, designed to steady or guide the stuff during the operation of planing, and as it leaves the feed box, the guide *q*, being permanently fixed in a line with one side of the feed box, and the guide *t*, having attached to it a spring which presses it against the stuff keeping it in close contact with the guide, *q*. The stuff is also kept steady by means of a bar passing from the stands *m*, and *n*, which bar may be raised or depressed in the same manner and simultaneously with the shafts which hold the cutters by means of the screws in Fig. 5.

No claim for originality being urged for the general operation of the machine, or the gearing, it is considered unnecessary to give a minute description of all the detached portions of the machine, or their operation, sufficient explicitness being believed to be given to

enable mechanics, (with the aid of drawings and model) to readily construct machines.

What I claim as my invention, and for which I ask for Letters patent, is the new and peculiar construction of the stock for holding the cutters, being in two parts and capable of being shifted by means of a nut and screw, so as to accommodate it to the width of different styles of sash required, by varying the width of the middle cutter. I also claim application of the middle cutter, the work performed by which having heretofore been done by hand labor: and the application of the chain and fixtures to machines for dressing sash and blinds — also the new form of *caps*, over the knives or cutters, principally claiming for the improved form of the stock, and its capacity of being shifted to the different styles of sash, and the centre or middle cutter.

ALFRED ANSON.

Witness,
JAS. D. PINCKNEY,
SAML. DUBOIS.

STATE OF NEW YORK, }
GREENE COUNTY, ss. }

On this tenth day of November 1843, before the subscriber a justice of the peace in and for the County of Greene aforesaid personally appeared the foregoing named Alfred Anson, of Norwich, New London County, Connecticut, and made solemn oath that he verily believes himself to be original and first inventor of the improvement herein described in the construction of stocks for rotating cutters, for dressing and cutting window sash stuff, blinds, &c; and that he does not know or believe that the same was ever before known or used, and that he is a citizen of the United States.

IRA DUBOIS,
Justice of Peace.

STATE OF NEW YORK, }
GREENE COUNTY, ss. }

I, William Pierson, Clerk of the County of Greene, do hereby certify that Ira Dubois, Esqr., whose name is attached to the foregoing

affidavit, is a Justice of the Peace in and for said County duly authorized to administer oaths, that I am acquainted with the hand-writing of said Justice, and verily believe the signature attached to said affidavit or jurat, to be in the proper hand-writing of the said Ira Dubois, — Witness my hand and the seal of the said County of [L.S.] Greene this tenth day of November, one thousand eight hundred and forty three.

WILLIAM PIERSON,
Clerk.

P.O. Novr. 16th, 1843.

Sir,

Your application for a Patent, for alleged improvements in the machine for Dressing Sash Stuff, has been examined and found not to present any thing essentially new, and therefore a patent cannot be granted to you.

In a patent granted to Caleb B. Rogers, on the 20th, of Sept. 1838, for a Sash Dressing Machine, you will find that the planing stock is made in two parts for purpose and in the manner substantially similar to yours.

As to the application of the chain for feeding up the stuff you will find that described in a patent granted to James McGregor for a planing machine on the 9th of Jany. 1838. And the use of the middle cutter and the caps are well known devices which cannot authorize the grant of a patent — The cap is used in all hand planes, and has been applied to the planes in planing machines — and the middle cutter is involved in the method of cutting mouldings and in tonguing and grooving where one cutter is used for the edge of the tongue and on each side. You may elect to withdraw your application and receive back $20 of the money paid in by you or appeal from this decision in the manner pointed out in the enclosed circular.

Mr. Alfred Anson, H.L.E.
Norwich,
New London Co.,
Ct.

To the Commissioner of Patents.

Sir,

I hereby withdraw my application for a patent for improvements in a Machine for Dressing Window Sash and Window Blinds now in your Office and request that twenty dollars may be returned to me agreeably to the Provision of the Act of Congress authorizing such withdrawal.

ALFRED ANSON.

Troy, N.Y. August 14th, 1844.

P.S.

Please Direct to me Troy, Rensselaer County, N.Y. (not at Norwich, Ct.)

ALFRED ANSON.

[Endorsed:]

Withdl

7 —

Free.

H. L. Ellsworth, Commissioner of Patents, Washington, D.C.

Patent Office, 17 August, 1844.

Please date, sign, and return the above Receipt to this Office, and a check for twenty dollars will be transmitted.

H. L. ELLSWORTH,
Commissioner of Patents.

Mr. Alfred Anson,
Troy, N.Y.

To the Commissioner of Patents.

Sir,

I hereby withdraw my application for a Patent for a Machine for Dressing Sash and Window Blinds now in your Office, and request that Twenty Dollars may be refunded to me at Troy, N.Y. agreeably to an act of Congress, in such cases made and provided.

ALFRED ANSON.

Troy, N.Y. August 20th, 1844.

T. W. L. ELSWORTH Esq.
Commissioner, &c.

Will the Commissioner of Patents inform the applicant whether this claim interferes with any other patent soon as practible.

Respectfully Yur, Obdient Sevt,

ALFRED ANSON.

[Endorsed:]
Thirty dollars.

To his Honor
WM. L. ELSWORTH, Esq.,
Commissioner of Patents for the United States.

The petition of Alfred Anson of Norwich, New London County and State of Connecticut respectfully represents, that your petitioner has invented a new and useful improvement in the art of dressing out and preparring stuff for window sash, window blinds &c. which has not been hereto used or known, the advantage of which he is desirous of securing to himself and his legal representatives; he therefore prays that letters patent of the United States may be issued granting to your petitioner his heirs, administrators or assigns, the full and exclusive right of making, constructing, using and vending to others to be used his said improvement agreeably to the Acts of Congress made and provided, Your petitioner having herewith forwarded thirty dollars to the Department and complied with other provisions of said Acts.

In presence of, ALFRED ANSON.
JOHN PRENTICE,
JOEL BURDICK.

Alfred Anson.

Town of Norwich
County of New London
State of Connecticut

Dressing and Preparing Sash Stuff.

Rec'd 16 August 1843.
Petition
Affidavit } rec'd
Specification }
2 Drawing, sketches rec'd
Model, rec'd Sept 9.
Treasurer's certificate
$30. Bknts $15, of which is returned being small notes.
Examined
Issue
Patented , 184.
Recorded Vol. , page
$15, rec'd Sept. 6—
Sent Paper 17, Augt. 44.
22, Augt. 44.
Z. Pratt.
Spt. Dr. returned Oct 11, 1843.
Exd. H.H. rejected Novr. 16. 1843—

DEFENDANT'S EXHIBIT M.—D.B.H., Special Examiner.

COPY OF RECORD OF PROBATE COURT, BRISTOL COUNTY, R.I., APPLICATION AND APPOINTMENT OF MARY REYNOLDS AND JOSEPH REYNOLDS AS ADMINISTRATORS OF THE ESTATE OF GREENWOOD REYNOLDS.

[PUT IN EVIDENCE, PAGE 171, VOL. 1.]

COURT OF PROBATE Monday Dec. 7th 1840.

Application for the appointment of an administrator on estate of Greenwood Reynolds, deceased.

COURT OF PROBATE Monday Jany, 4th 1841.

Mary Reynolds and Joseph Reynolds appointed administrators on the estate of Greenwood Reynolds late of Bristol deceased they to

give bond in the sum of fifteen hundred dollars with Barnard Smith and Benjamin Norris sureties and Barnard Smith, Benjamin Norris and Thomas Wilson Jun. appraisers, the estate represented Insolvent, and Barnard Smith, Benjamin Hall and Benjamin Norris appointed Commissioners and six months from this date allowed them to receive claims.

PROBATE COURT Monday May 3rd 1841.

Inventory of personal estate of Greenwood Reynolds Decd. was presented by the administrators who were engaged to the truth of the same, allowed and ordered recorded.

COURT OF PROBATE Monday December 6th 1841.

The report of Commissioners on the estate of Greend. Reynolds deceased was presented for allowance.

COURT OF PROBATE Monday January 3d A.D. 1842.

The report of Commissioners on the estate of Greenwood Reynolds was allowed and ordered recorded, legal notice on the same having been given in the Phœnix.

PROBATE CLERK'S OFFICE, Bristol R.I. June 7, 1876.

I hereby certify that the aforegoing is a true copy from the Probate Records in this office.

In testimony whereof I do hereto set my hand and official seal of [SEAL] office the day and year last above written.

PETER GLADDING,
Probate Clerk.

DEFENDANT'S EXHIBIT N.—D.B.H., Special Examiner.

CERTIFIED COPY OF TWO AFFIDAVITS OF JOSEPH REYNOLDS IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 177, VOL. 1.]

RHODE ISLAND DISTRICT, SC.

CIRCUIT COURT OF THE UNITED STATES.

Nathan Mason
vs
William Tallman &
James C. Bucklin, } In Equity.

I, Joseph Reynolds, of the city and county of Providence, on oath do depose and say: That I have worked for Mess. Tallman and Bucklin for the greater part of the time for the last fourteen years and am now in the employment of said Tallman; that I was well acquainted with the Planing Machines operated by them during the spring and summer of 1850, which machines were destroyed by fire in the early part of September last.

That I am also acquainted with the Planing Machines now operated by them, and that said machines are built after Norcross Patent and were built by Norcross himself, and are constituted upon a different principle from the Woodworth machines, which said Tallman and Bucklin formerly operated: That the moulding machine now operated by said Defendant is constituted upon a different principle from the Woodworth machines, and is so far as this affiant is informed and believes of his own invention: and that the grooving machine now operated by said Defendant is also of different construction and principle from the Woodworth machines, and is used for grooving alone, and that said moulding machine is now in common and general use: and further that no one of the machines now in operation was in operation previous to the fire.

JOSEPH REYNOLDS.

RHODE ISLAND DISTRICT, SC.

In the city of Providence this 28th day of April A.D. 1851.

Then personally appeared Joseph Reynolds and made oath that the facts and statements contained in the within affidavit by him signed are true.

Before me,

T. A. JENCKES,
U.S. Commissioner.

I, Joseph Reynolds, further make oath: That while the Defendants were operating the Woodworth machines several years ago they attempted to make mouldings in a machine, built upon the principle of that patent: the mouldings then made were worthless, and the machine was stopped and laid aside. Sometime afterwards, the machine was turned over to me, and I found the defect to be in the combination with the rollers, and that pressure rollers would not answer the purpose at all for cutting mouldings: that they were required to be of sufficient size and strength to resist the pressure of the board, and had to be placed far enough apart, to be beyond the reach of the cutter, and were thus necessarily placed so far from the point where the knife was cutting, that the wood was not held firmly in its position beneath the cutter wheels, and was splintered or broken by the knives and lifted from its bearings, thus making very bad work: I then dispensed with the whole combination of rollers and adopted plates, upon each side of the cutter, held down by weights upon a lever, to hold the wood in its place, one being placed so as to press firmly on the board, just in front of the cutter, holding it down and preventing the knives from splintering or breaking the wood, and preventing the board from being lifted up, and one fitted into the moulding as it came out finished, and holding it in its place, after it had passed beneath the cutter.

By this combination we could make smooth and perfect work: I do not consider these plates as an analogous device or mere equivalent to the rollers, for the rollers would not answer at all for the purpose of making mouldings unless the wood was very thick, and then, not without springing the wood: and these plates succeeded perfectly, and were so far as I know, entirely new in their application to this purpose and different in principle from the rollers. In my

opinion this machine, is an entirely different and superior combination to the Woodworth machines.

I have seen tonguing and grooving machines similar to that now used by the Defendant, and also a machine for grooving and for tonguing, with a single cutter wheel, in various places, and have always understood that cutter wheels, used for this purpose, when operated by themselves, and not in connection with any device or combination of the Woodworth machine were common and public property, and could be used, without infringement upon said Woodworth's patent.

The machine used by the Defendants consists of two cutter wheels, without pressure rollers, or any other combination of the Woodworth machine.

JOSEPH REYNOLDS.

RHODE ISLAND DISTRICT SC.

Subscribed and sworn to before me this 3d day of April 1851.

Before me,

T. A. JENCKES,

U.S. Commissioner.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE CIRCUIT COURT,

AT PROVIDENCE, June 8th A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing four pages contain a true copy from the original now on file in this office, in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said Court [SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT O. — D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ELERY ALLEN IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 268, VOL. 1.]

Elery Allen of the city and county of Providence of lawful age, on oath, deposes and says, that he has known and been familiar with "Woodworth's Planing Machines," so called, owned and used by Tallman and Bucklin, from the time that the same were first purchased by them. That he worked for Tallman & Bucklin at the time they bought the patent right and machines, and has remained with them ever since, with the exception of two or three years.

That he has run one of these machines for Tallman & Bucklin, constantly since 1843, and that the machines now used and run by them are the same in principle and in practical working, as those originally purchased. That there has been no change in said machines and that nothing has been done to them, except to keep them in suitable order since 1843.

ELERY ALLEN.

RHODE ISLAND DISTRICT, SC.

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, July 15, 1850.

Then personally appeared the before named Elery Allen, and made oath that the facts and statements in the within affidavit contained were true and correct, according to the best of his knowledge and belief.

Before me,
JOHN T. PITMAN,
Clerk.

DISTRICT OF RHODE ISLAND.

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing pages contain a true copy, from the origi-

opinion this machine, is an entirely different and superior combination to the Woodworth machines.

I have seen tonguing and grooving machines similar to that now used by the Defendant, and also a machine for grooving and for tonguing, with a single cutter wheel, in various places, and have always understood that cutter wheels, used for this purpose, when operated by themselves, and not in connection with any device or combination of the Woodworth machine were common and public property, and could be used, without infringement upon said Woodworth's patent.

The machine used by the Defendants consists of two cutter wheels, without pressure rollers, or any other combination of the Woodworth machine.

JOSEPH REYNOLDS.

RHODE ISLAND DISTRICT SC.

Subscribed and sworn to before me this 3d day of April 1851.

Before me,

T. A. JENCKES,
U.S. Commissioner.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE CIRCUIT COURT,
AT PROVIDENCE, June 8th A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing four pages contain a true copy from the original now on file in this office, in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said Court
[SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT O. — D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ELERY ALLEN IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 268, VOL. 1.]

Elery Allen of the city and county of Providence of lawful age, on oath, deposes and says, that he has known and been familiar with "Woodworth's Planing Machines," so called, owned and used by Tallman and Bucklin, from the time that the same were first purchased by them. That he worked for Tallman & Bucklin at the time they bought the patent right and machines, and has remained with them ever since, with the exception of two or three years.

That he has run one of these machines for Tallman & Bucklin, constantly since 1843, and that the machines now used and run by them are the same in principle and in practical working, as those originally purchased. That there has been no change in said machines and that nothing has been done to them, except to keep them in suitable order since 1843.

ELERY ALLEN.

RHODE ISLAND DISTRICT, SC.

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, July 15, 1850.

Then personally appeared the before named Elery Allen, and made oath that the facts and statements in the within affidavit contained were true and correct, according to the best of his knowledge and belief.

Before me,
JOHN T. PITMAN,
Clerk.

DISTRICT OF RHODE ISLAND.

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing pages contain a true copy, from the origi-

nal now on file in this office, in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the Seal of said Court, [SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT P. — D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF WILLIAM TALLMAN AND JAMES C. BUCKLIN IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 272, VOL. 1.]

RHODE ISLAND DISTRICT, SC.

CIRCUIT COURT OF THE UNITED STATES.

Nathan Mason
vs.
Tallman & Bucklin, } In Equity.

William Tallman and James C. Bucklin defendants in said suit, on oath do depose and say: That the Planing Machines constructed according to the Woodworth patent, which were operated by them, in the spring and summer of 1850, were entirely destroyed by fire, in the early part of September last: That they have now in operation two planing machines, constructed according to the Norcross patent, by the license and authority of the patentee: That the same are constructed upon principles entirely new and different from those patented in the Woodworth machine: That they are also using two other machines, one for making mouldings and one for tonguing and grooving boards, which are not similar to those formerly used, and are not in the opinion of these affiants an infringement of the Woodworth patent: that the machine for cutting mouldings is of a different construction, and upon a new principle from the Woodworth machine, that in their machine the rotating cutter wheels, are not used in combination with rollers, or any analogous device: but the

board which is to be converted into a moulding is held in its place by plates, which are held down by a lever and weights and which are self adjusting, adapting themselves to thicker or thinner work. The pressure rollers are altogether dispensed with, and in fact are not at all suited for the purpose: that these plates were first invented and substituted for the rollers by Joseph Reynolds from twelve to fourteen years since, while in the employment of these defendants, and have been in common use since as public property: That these plates are superior to the rollers in being self adjusting, in fitting into the mouldings and in being susceptible of being placed nearer the cutter, thus holding the wood more firmly in its place beneath the cut of the knife: and constitute in the opinion of these affiants an entirely different and superior combination to that in the Woodworth machine.

In the tonguing and grooving machine the boards are merely tongued and grooved or jointed by means of cutter wheels alone: these cutter wheels are not used in combination with pressure rollers, or with rotating planes, or with any other device or combination similar to those used in the Woodworth machine:

These affiants have seen machines constructed like this in common and general use, for many years, and have always understood, that the cutter wheels used alone and without any of the combinations of the Woodworth patent, were common and public property.

These affiants further state that they formerly and more than fifteen years since, constructed and used a machine for tonguing and grooving with a single cutter wheel, similar to those used in their present machine, and operated the same for many years, without any claim from any person that they were infringing the Woodworth patent. They have also seen similar machines in operation in Lowell and in other places, as common property, at various times, within the last ten years.

The machine now in use by them was built in Worcester, and was purchased of N. G. Norcross; similar machines are built and sold publicly in Worcester and in New Bedford, and these affiants have never heard of the makers being prosecuted for an infringement of

the Woodworth patent, and know of no case in which the matter has been brought before a Court and adjudicated upon.

WILLIAM TALLMAN.
JAMES C BUCKLIN.

RHODE ISLAND DISTRICT, SC.

Subscribed and sworn to before me this 3d day of April A.D. 1851.

Before me,
T. A. JENCKES,
U.S. Commissioner.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, June A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing three pages contain a true copy from the original now on file in this Office in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof, I have hereunto set the Seal of said Court [SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT Q. — D.B.H., Special Examiner.

[PUT IN EVIDENCE, PAGE 276, VOL. 1.]

Moulton & Ingraham,

1845		To Tallman & Bucklin, Dr.			
Jany	6	To 105 ft Bds. Pld. & Jld	2c		2.10
	28	" 1000 Clap Bds. " & Butted	$4M		40.00
Feby	10	" 15 ft Moulding	2½c		.38
	17	" 12 Lights 8x12 Sash	5½		.66
	18	" 300 Clap Bds Pld & Butted	$40M	1200	
		" 8 Lights 6x8 Sash	3¼	26	12.26
Mch	20	" 54 ft Gutter	10c		5.40
	24	" 24 Lights 10x14 Sash	7c		1.68
	26	" 40 " 7x9 "	3½		1.40

April	2	To 150 Clap. Bds. Pld & Bld $36M		5.40	
		" 12 lights sash 10x14 — 1 1-8m 7c		.84	6.24
	11	" 200 Clap Bds Pld. & Btd $36M			7.20
	14	" 156 ft. S. H. P Timber. 25M			3.90
May	19	" 1 ps. Lumber S. H. P.			1.00
"	26	" 4 Cellar Casements 20c			.80
June	12	" 74 ft. gutter 10c			7.40
"	13	" 144 Lights 9x14 1 3-8 lip Sash 7			10.08
"	17	" 104 ft Moulding 2 2½c			2.60
"	20	" 800 Clap. Bds. Pld & Butted $42M			33.60
"	23	" 2 Cedar Posts $2.			4.00
"	27	" 225 ft Bds pld. & Mchd. 16M			3.60
July	12	" 230 " Threshold Stuff 3c			6.90
"	18	" 208 ft S. H. P. Bds. Pld. & Jld. $30M			6.24
		" 147 " Spruce Joist		$13M	1.91
Aug	27	" 2 Low Cedar Posts			3.75
"	29	" 168 Lights. 10x17 1 3-4in lip sash 11½c		19.32	
		" 84 " 10x16. 1 3-8 10c		8.40	27.72
"	30	" 1 Cellar Casement			.20
Sep	4	" 1 Door 6-6x2-6, 1 1-8in $2 1-8	$2.25	1 11.63	
		" 9 " 6-6x2-6 1 1-8 7-8in 10-6	15.75		18.00
"	13	" 25 Clap Bds. Pld & Btd. $36M			.90
"	27	" 3-4 hour Sawing by Davis 3			.37
"	30	" 72 Lights 1 1-8, 7-9 Sash	3 1-2c	2.52	
"	"	" 12 " " 8x12 "	5 1-2	.66	3.18
Oct	14	" 1 Door 2-6 by 6-6			1.62
"	21	" 1 Sash Door, (2d hand)		3.50	
		" 24 Lights 11-15 Sash & Glass 20c		4.80	8.30
Nov	10	" 2 1-2 hours Sawing	6		2.50
"	13	" 1 Door 6-6 by 2-6 1 1-4 in			2.33
Dec	2	" 78 ft Threshold	3c	2.34	
"	"	" 38 " "	3 1-4c	1.24	3.58
"	"	" 11 Doors 6x10 by 2x10 1 3-8 in	$3	33.00	
"	"	" 10 " 6x8 " 2x8 1 3-8 in	$2 3-4	27.50	60.50

Dec.	3	To 1 Door 6x8 by 2x8 1 3-8 in				2.50
"	6	" 133 ft Spruce Plank		$14M	1.86	
"	"	" 52 " " "		$18M	.94	
"	"	" Sawing			.33	3.13
"	10	" 164 Lights 10x14 1 in Cherry Sash 14c				22.96
						$320 89
E Excepts			Diet			89
						$320 00

Providence, Jany 6, 1846. Received Payment. Tallman & Bucklin,
pr J. J. Bucklin.

DEFENDANT'S EXHIBIT U.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ALBERT G. SPRAGUE ON PETITION FOR INJUNCTION IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 344, VOL. 1.]

CIRCUIT COURT OF THE UNITED STATES,

DISTRICT OF RHODE ISLAND.

Nathan Mason
vs.
William Talman &
James C. Bucklin, } In Equity.

CITY OF PROVIDENCE, SC.

Albert G. Sprague, of the city of Providence Rhode Island, being duly cautioned and sworn deposes and says, that he is acquainted with all the parties to this suit, but that he has no interest in it. That he is theoretically and practically acquainted with machines and machinery.

That he is acquainted with the Letter Patent of William Woodworth, issued December 27th, 1828, re-issued July 8th, 1845, and with the planing machines constructed under it.

That he on the ninth day of July, 1850, visited the planing mill, owned and occupied by the Defendants in the city of Providence, and that he then and there saw five Woodworth planing machines, four of which were belted ready for use, three for the purpose of planing boards and one for working mouldings.

And that he saw in use one of the said planing machines, working on planing boards and further this deponent saith not.

ALBERT G. SPRAGUE.

RHODE ISLAND DISTRICT, sc.

CLERK'S OFFICE, CIRCUIT COURT,
AT PROVIDENCE, May 24th, 1850.

Then personally appeared the above named Albert G. Sprague, and made oath that the facts and statements therein contained, are true and correct, according to the best of his knowledge and belief.

Before me,

JOHN T. PITMAN,
Clerk.

RHODE ISLAND DISTRICT, sc.

CLERK'S OFFICE, CIRCUIT COURT,
AT PROVIDENCE, July 10th, 1850.

The personally appeared the above named Albert G. Sprague, and made oath, that the facts and statements therein contained are true and correct, according to the best of his knowledge and belief.

Before me,

JOHN T. PITMAN,
Clerk.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE, CIRCUIT COURT,
AT PROVIDENCE, June 8th A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify, that the foregoing two pages, contain a true copy from the

original now on file in this Office in the cause in Equity, Nathan Mason *et al. vs.* Tallman and Bucklin.

In testimony whereof I have hereunto set the seal of said Court and [SEAL] my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

COMPLAINANT'S EXHIBIT V.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ALBERT G. SPRAGUE, ON PETITION FOR COMMITMENT IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 346, VOL. 1.]

Albert G. Sprague of the city of Providence Rhode Island, being duly sworn deposes and says—

That he has a theoretical and practical knowledge of the science of Machinery, that he is familiar with the Letter Patent issued to William Woodworth, deceased, for a planing, tonguing and grooving machine, dated December 27th, 1828, having heretofore had occasion to examine them.

That he is fully acquainted with the construction of machines under said Patent, having taken part in planning and constructing them; that he is now engaged in conducting an establishment, in which several of these Machines are operated, and that he has not any interest in the said Letters Patent, or in the rights secured by them.

And he further states that he has on various occasions visited the planing mill conducted by Talman and Bucklin in this city, and that he has seen the said William Talman, since the first day of January last at and about said mill, directing and overseeing the men employed there, engaged in operating the planing, tonguing and grooving machines in said planing mill.

And that on the 19th day of April, 1851, he was in the said planing mill, and while there saw three planing or surfacing machines, belted and ready for use, and two of them then in operation, planing

boards, each having the essential features of the Woodworth Invention, viz. a planing cylinder in combination with pressure and with-feed rollers, and one of the three, being of precisely the same arrangement and construction in its working parts, with one used for the same purpose of moulding by them, the said Tallman and Bucklin, prior to the burning of their mill in the month of September last.

The other two machines were constructed under the Norcross Patent, that is having the cylinder under the plank. This arrangement may be an improvement, but I do not think that this arrangement varies the principle of the machine. And that he also saw in operation on this occasion, a machine tonguing and grooving boards by means of a combination of cutter wheels and pressure and feeding rollers, being the identical device for that purpose set forth in said Letters Patent, and being precisely the same arrangement of cutter wheels and pressure and feed rollers used by them for this purpose, in their former planing mill, prior to the burning thereof.

And this deponent further says, that his engagements, and business, often leads him past the said planing mill, and that he has no doubt but that there are over four thousand feet of boards worked in said machine per day.

ALBERT G. SPRAGUE.

April 29, 1851.

Sworn to before me,

JOHN T. PITMAN,
Clerk.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE, CIRCUIT COURT,
AT PROVIDENCE, June A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing two pages contain a true copy from the original now on file in this office in the cause in Equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof, I have hereunto set the seal of said Court [SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

COMPLAINANT'S EXHIBIT W. — D. B. H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ALBERT G. SPRAGUE IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 346, VOL. 1.]

Albert G. Sprague of the city of Providence and State of Rhode Island, being duly sworn deposes and says,

That he was well acquainted with the construction and mode of operation of the machine, for Planing Tonguing and Grooving, used by the firm of Tallman and Bucklin, at their mill in this City and which was burned during the month of September last.

That in using the machine for making mouldings, the material was fed or passed through the machine by means of a single pair of feeding rollers, which were placed near one end of the machine, and to which the rough material was first applied, after passing these, it passed under a weighted lever, which was so applied as to hold it firmly down to the bed plate by pressing upon it at a point near to where the knife operated on it, this knife formed part of a revolving cylinder, which in its motion removed all that part of the material which projected above or beyond the plane of it motion; after passing the revolving cylinder, it passed under and was held down by another weighted lever and out of the machine: in this machine, the revolving cylinder formed the moulding, from the rough material, and the weighted lever held the material and the weighted lever held the material down against the lifting action of the revolving knife, the material was passed through the machine, by means of the roller, so that in this, we have an organized machine with a revolving cylindrical plane and the analogous device of the pressure roller, in the form of weighted levers, for holding the material down.

In the machine then used by them for working or tonguing and grooving the edges of boards, &c., the material was first received by a pair of feeding and pressure rollers, which passed it along to the revolving cylinder, after being reduced in its thickness or surfaced, it passed under a small pressure roller and then passed between the tonguing and grooving wheel, and had the tongue and groove formed

in its edges, from there it advanced to another pair of pressure and feeding rollers, which carried the material out of the machine; here we have the revolving cutter wheels for working the tongue and groove and the pressure applied through rollers to prevent the material from being advanced in towards the axis of these cutter wheels, each of these machines having the device claimed in said Patent of William Woodworth, deceased, dated December 27th, 1828.

In the machine now used for the purpose of making mouldings, these are all the operating parts, and no others than those above set forth and which were used to perform the same operation, and these several parts were then arranged precisely as they are now, the only difference being that the machine burned was an old planing machine adapted by alterations to this purpose, and the present machine has the old parts of the old machine with a new frame of wood to hold them in position.

In the machine now used for making the tongue and groove, these are all the operating parts of the old machine, except that there is no planing cylinder, to reduce or plane the surface at the same time, so that the pairs of feeding rollers are brought near together with the cutter wheels between each pair of them.

Some of the cutter wheels now used are those used prior to the burning of the old mill, and are applied in the new machine in the same combination of pressure rollers, and do their work in precisely the same way.

I consider the invention of said Letters Patent to be a combination of a revolving cylinder with pressure so applied, as to prevent the material operated on from being drawn inwards towards the axis of motion by the revolving cylinder or cutter wheel while operating on it.

That with the cutter wheels in general use throughout the country for tonguing and grooving purposes, there are no parts in or tools in combination to form a machine: the cutter wheel is placed on a shaft like a circular saw, and projects upwards through a bench, the material is held down to be operated on, by the hand, and when this is removed, the material, having nothing to retain it on the bench,

falls, or is thrown off. From this it will be seen, that this lacks the features of being part of a machine, and the combination of pressure with the revolving cutter.

And this Deponent further says that he has examined the models herewith submitted marked "A.N.M. *vs.* T and B" a "B.N.M. *vs.* T & B," to which he refers, as exhibiting more plainly the contrivance to which he has heretofore referred, and which he regards as representing in model form the machine, or the working parts of the machine, now used by the said firm of Talman & Bucklin in their planing mill in this city, and that there are in each represented the revolving cutter wheel in combination with pressure, to prevent the lifting or drawing action of the cutter, while operating on the material passing through the machine.

ALBERT G. SPRAGUE.

May 2d, 1851.

Sworn to before me,

JOHN T. PITMAN,
Clerk.

District of Rhode Island, sc.

Clerk's Office, Circuit Court,
At Providence, June 8th, 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the above and foregoing four pages contain a true copy from the original now on file in this office in the cause in Equity Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said Court [seal] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT X.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE AFFIDAVIT OF ARNOLD PETERS IN THE SUIT OF MASON *vs.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 353, VOL. 1.]

RHODE ISLAND DISTRICT, SC.

CIRCUIT COURT OF THE UNITED STATES.

Nathan Mason
vs
Tallman & Bucklin, } In Equity.

I, Arnold Peters, of the city and county of Providence, machinist and draughtsman, on oath do depose and say: That I have had considerable experience with machinery for many years both in constructing and draughting machines. That I have frequently seen the Woodworth Planing machines and am acquainted with their construction and operation and examined some of said machines on the 29th of April inst. That I have also examined the machines for making mouldings and for tonguing and grooving boards now in operation at the workshop of the defendants: that said machines differ from the Woodworth machines in construction and in principle, in the following particulars:—

In the moulding machine the rotating cutters are not used in combination with rollers or any analogous device, but the wood which is to be converted into a moulding is held in its place by plates, which are held down by a lever and weights, and are self-adjusting, adapting themselves to thicker or thinner work. The pressure rollers are altogether dispensed with, and would be unfit for the purpose. These plates constitute a new and different principle from the rollers, and are superior to them in being self-adjusting and being susceptible of being placed nearer the cutter, in fitting into the moulding and holding it more firmly in its place beneath the cut of the knife, and in my opinion constitute an entirely different and superior combination to that in the Woodworth machines.

In the tonguing and grooving machine, the boards are merely

tongued and grooved or jointed; the cutter wheels are not used in combination with the rotating planes, or with the pressure rollers, or with any other combination similar to those used in the Woodworth machine.

ARNOLD PETERS.

RHODE ISLAND DISTRICT, SC.

Subscribed and sworn to before me this first day of May A.D. 1851.

T. A. JENCKES,
U.S. Commissioner.

DISTRICT OF RHODE ISLAND.

CLERK'S OFFICE, CIRCUIT COURT,
AT PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, Clerk of said Court for said District, do hereby certify that the foregoing pages contain a true copy from the original now on file in this office in the cause in Equity, Nathan Mason *et al. vs.* Tallman and Bucklin.

In testimony whereof I have hereunto set the seal of said Court [SEAL] and my hand on the day and year above written.

HENRY PITMAN, *Clerk.*

DEFENDANT'S EXHIBIT Y. — D.B.H., Special Examiner.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these presents shall come, GREETING:

This is to certify that the annexed is a true copy from the files of this office of the file wrapper and contents and drawing in the matter of the application of Joseph P. Woodbury, filed June 3rd, 1848., for Impt. in holding down plank for planing.

In testimony whereof, I. W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this second day of June in the year of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one-hundredth.

[SEAL]

W. H. DOOLITTLE,
Acting Commissioner.

To the Commissioner of Patents:

The petition of Joseph P. Woodbury, of Boston, County of Suffolk and State of Massachusetts, respectfully represents, —

That your petitioner has invented a certain new and useful improvement in holding down plank to be planed, which has not, as he verily believes, been heretofore used or known, and that he is desirous that letters patent of the United States may be granted to him therefor, securing to him and to his legal representatives, the exclusive right of making and using, and of vending to others the privilege to make or use the same, agreeably to the provisions of the Acts of Congress in that case made and provided, he having paid thirty dollars into the Treasury of the United States, and complied with the other requirements of the said acts.

And your petitioner does hereby authorize and empower J. James Greenough, as attorney for your petitioner, to alter or modify the within specification and claim as he may deem expedient; and also

to receive back any moneys which your petitioner may be entitled to withdraw, and to receipt for the same.

JOSEPH P. WOODBURY.

CITY OF WASHINGTON, } ss.
DISTRICT OF COLUMBIA, }

On this third day of June, 1848, before the subscriber, a Justice of the Peace in and for the said city, personally appeared the within named Joseph P. Woodbury and made solemn oath according to law, that he verily believes himself to be the original and first inventor of the within described improvements in planing machines, and that he does not know or believe that the same has been before used or known; and that he is a citizen of the United States.

Sworn before
R. K. MORSELL,
J.P.

To all to whom these presents shall come:

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented a certain new and useful improvement in holding down materials in planing machines, and that the following is a full, clear and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing which shows a side elevation of a machine with the improvements attached.

Various devices have been resorted to, for the purpose of holding down plank and boards to be planed by machinery, the most common of which is a pair of rollers placed before and behind the cutters, but it is found in practice that the rapidly revolving cutters cause a tremulous motion in the plank or board, and cause a succession of wavy cuts, much greater than if the board was held fast. Besides this, when rollers are used, they cannot be made to bear upon the board near enough to the cutters to prevent a spring in it, and they roll over the chips and shavings, and make the indentations on the board. My improvement is made to counteract these defects, which has been found by long experimental practice to obviate all the difficulties.

The frame, platform, cutters, &c., are like those of the ordinary cylinder planing machines; but instead of the rollers above named, I employ a straight smooth bar of metal, which is so placed as just to clear the edges of the cutters. In the drawing the end of such a bar is shown at *a*; it is connected with the cutter frame, and rises and falls with it, and has besides a separate adjustment if required. Another mode of attaching the bar and the one best adapted to bear upon the unplaned plank, is to connect it with the frame by means of a bent spring, shown at *b* in the drawing, one end of which is affixed to the bar *c*, the other to the cutter frame. In the drawing this bar is set off some distance from the cutter, in order to show it more distinctly; but it may be brought nearly up to the cutter, with only sufficient distance between to allow such play to the bar as is necessary to conform to the inequalities of the board to be planed: a board thus held down is kept steady, and the tremor so obvious when rollers are used is entirely checked, the plank is planed smoother, and with much less chance of damage to the cutters.

Having thus fully described my improvements in holding down boards in planing machines, what I claim therein as new, and for which I desire to secure letters patent, is the employment of straight stationary bars, in combination with the rotary cutters as described, whether attached to the frame by springs or otherwise.

JOSEPH P. WOODBURY.

WM. GREENOUGH, } witnesses.
ELIJAH PRATT, }

No. 1331. 10 JULY, 1848.

In conformity to an act of congress entitled "An act to promote the progress of the useful arts," approved 4th of July, 1836, I have received of J. P. Woodbury, Boston, Mass., thirty dollars, which sum has been placed to the credit of my account in the Treasury U. States under the date of 3d June, 1848, and for which I have signed a receipt for a patent Impt. for holding down plank for planing.

W. SELDEN, *Treasurer of the United States.*

Registered, — J.C.H.

DANIEL GRAHAM,

Register of the Treasury.

PATENT OFFICE, Feby. 20, 1849.

Sir,—Your claim to letters patent for alleged improvements in processes for planing machines has been examined and found to present nothing essentially new or patentable.

You are referred to letters patent granted to B. Brown and J. S. L. Hunt in Oct. 1845.

You can withdraw or appeal.

E.B.

To Jos. P. WOODBURY, Esqr.,
Care of J. J. Greenough,
Washington, D.C.

[Endorsed:]

Copy of Office Letter to Jos. P. Woodbury, July 20, 1849.

To the Commissioner of Patents:

Sir,—I hereby withdraw my application for a patent for a Planing Machine now in your office, and request that twenty dollars may be funded to me, agreeable to an act of Congress in such cases made and provided.

J. P. WOODBURY,
pr. J. J. GREENOUGH,
Atty.

Washington, 4 Oct. 1852.

[Endorsed:]

Withdrawn Oct. 4, 1852.

BOSTON, August 25, 1854.

Sir,—On the 18th March last I forwarded to the Patent Office power of Attorney in the case of an *old* application of Jos. P. Woodbury for improvement in planing machines with the request that the papers in the case might be forwarded to me.

On the 23d March the Office writes me that the case has not yet been examined.

On the 6th of May, 1854, not hearing from the Office upon the subject, I again requested that I might be informed when this case would be examined — to this letter I received no reply,— and on the 5th August I again addressed the Commissioner requesting him to inform me if the papers and drawings in this case were lost if I might be allowed to withdraw the model for the purpose of preparing new ones. In reply to this letter I was informed that no more definite information could be given respecting this application than was contained in Patent Office letter of 20th June, 1854, addressed to Mr. Woodbury and my care.

I am led to believe that the Office does not refer in any of its letters to the old application of Mr Woodbury's but to a more recent one which is still pending in the Office, as a letter dated 20th June, 1854, was received in the recent case which contained no reference to the old one.

The application upon which I desire information is I believe entitled "*an improvement in pressure in planing* machines," and was filed on or about *June 3 1848*.

If the specification and drawings in this case be in the office I respectfully request that they may be forwarded to me. If there be neither drawings nor specification in the case will you please inform me in reply to my letter of August 5th, 1854, whether the model in the case can be withdrawn for the purpose of replacing the drawings and specification.

Very respectfully,

Your Obedt. Servt.,

SAM. COOPER.

Hon. CHAS. MASON,
Commissioner of Patents,
Washington, D.C.

[Endorsed:]

Rec'd & filed 29th Aug. 1854.

Letter of S. Cooper, Esq., asking information about the application.

U.S. Pat. Off., 29th Aug., '54.

Sir, — The difficulty in relation to that *old* application of Mr. Joseph P. Woodbury, seems to have arisen from the fact that the case was not referred to in a sufficiently explicit manner. Mr. Woodbury having a pending application for a Patent for a Planing Machine, and there having been no reference made to the time when the *old* application was filed, it was thought that the pending case was the one referred to. You are now informed that Mr. Woodbury's application for a Patent for "Improvement in holding down material in Planing Machines," was withdrawn by J. J. Greenough, and the money paid to him on the 4th of October, 1852 — it having been rejected on the 28th of February, 1849. The specification and one drawing are in the Office, one of the drawings having been withdrawn, and either of these can be forwarded if you desire it; but both cannot be sent out of the Office at once.

Respectfully,

Act'g Comms of Patents.

Saml Cooper Esqr., Boston, Mass.

[Endorsed:]

Office Letter of 29th August 1854, giving information.

Boston, Sept. 1, 1854.

Sir, — I have the honor to acknowledge receipt of Patent Office letter of 29 ulto. on the subject of Jos. P. Woodbury's *withdrawn* application for "Improvement in holding down material in planing machines," and to request that the remaining drawing may be forwarded to me, with the understanding that it shall be returned again to the Office so soon as drawings for a new application can be prepared.

2dly, Please forward at the earliest convenience of the Office, a *copy* of the specification in the case, and also of the letter of rejection.

Very Respectfully,

Your Obt. Servt.,

Hon. Chas. Mason, *Com. of Pats*, SAM. COOPER.

Washington.

[In margin :]
Attended to.
L. ELIOT.
[Endorsed :]
Recd. and filed 6th Sept. 1854.

Letter from S. Cooper asking about the state of the application of Woodbury.

U.S. PAT. OFF., 6th Sept., 1854.

Sir,—It was under a mistake of the Examiner, that you were told (in the Letter from this Office of the 29th ultimo.) that *either* the drawing or the specification of the application of Joseph P. Woodbury might be sent to you, but *both* could not. As the application has been withdrawn, copies only of the drawings, specification, &c., can be furnished.

Respectfully,

Acting Commr. of Patents.

SAMUEL COOPER, Esq. Boston, Mass.

[Endorsed :]
Office Letter of 6th Sept., '54 to S. Cooper, Esqr.
Referring to Specification, Drawings, &c.

[Written in pencil :]
File of withdrawn appn. in Sangstons Room. Please put this letter in file. J.D.P.

POST OFFICE BOX 4135,
BOSTON, Mass., August 2d, 1870.

To the Commissioner of Patents,
Washington, D.C.

Hon. Sir, —I hereby revoke and cancel any and all powers of attorney given or granted by me to any person in the case of my rejected application for an improvement in holding down plank in planing machines dated June 3d 1848, June 3d 1848 Please to send to me a certified copy of the letter of rejection in the above case and I will remit the fees for the copy as soon as I am informed

of the amount, and will you also please to acknowledge the receipt of this letter of revocation and much oblige your obedient servant.

JOSEPH PAGE WOODBURY.

[Written in pencil:]
Letter of Regn., Augt. 6. B.

JOSEPH P. WOODBURY.

2064.

Of Boston,
County of Suffolk,
State of Mass.

Impt. in holding down plank for planing.

Rec'd	June 3, 1848.
Petition	"
Affidavit	"
Specification	"
Drawing	"
Model	"
Cert. dep.	
Cash, $30, June 3, 48 c.	
Examined.	
Issue.	
Patented , 184.	
Recorded Vol. , page	

Cash to J. J. GREENOUGH, *Atty.*
October 4th, 1852.
P.

J. J. GREENOUGH.

Rejected Feb. 20th, 1849.
Letter to S. Cooper, 29th August, '54.
Exd. — H.H.

DEFENDANTS' EXHIBIT Z. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JAMES MCGREGOR, JR., NO. 406, DATED AUGUST 28, 1833.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas, James McGregor Junr., a citizen of the United States, hath alleged that he has invented a new and useful improvement, being a machine for jointing, tonguing, grooving and planing plank for flooring houses, &c., which improvement he states has not been known or used before his application; hath made oath that he does verily believe that he is the true inventor or discoverer of the said improvement; has paid into the Treasury of the United States the sum of thirty dollars, delivered a receipt for the same, and presented a petition to the Secretary of State, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose: These are therefore to grant, according to law, to the said James McGregor, Jr., his heirs, administrators or assigns, for the term of fourteen years from the twenty-eighth day of August, one thousand eight hundred and thirty-three, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement: a description whereof is given in the words of the said James McGregor, Jr., himself in the schedule hereto annexed, and is made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the United States to be hereunto affixed.

Given under my hand, at the city of Washington, this twenty-eighth day of August in the year of our Lord one thousand eight [L.S.] hundred and thirty-three and of the independence of the United States of America the fifty-eighth.

By the President:

LOUIS M. LANE, *Secretary of State.* ANDREW JACKSON.

CITY OF WASHINGTON, TO WIT:

I do hereby certify, that the foregoing letters patent were delivered to me on the twenty-eighth day of August in the year of our Lord one thousand eight hundred and thirty-three to be examined; that I have examined the same, and find them conformable to law; and I do hereby return the same to the Secretary of State, within fifteen days from the date aforesaid, to wit, on this twenty-eighth day of August in the year aforesaid.

R. B. TANEY,
Attorney General of the United States.

1215. Andrew Jackson. McGregor. Ratcliffes. 1833. Louis McLane, Secy State.

(Hdy. see yellow book) R. B. Taney, Atty. Gen. of U.S. Aug. 28, 1833. James MacGregor Junr of Wilton, Saratoga Co. New York, a citizen of the United States.

Andrew Jackson.
Louis McLane.
Recorded Jan. 26, 1837.

Improvement being a machine for jointing, tonguing, grooving and planing plank for flooring houses and for other purposes. Date of Patent, Aug. 28, 1833.

[Words in italic written in pencil.] Do. Certificate of Atty. General, Aug. 28.

The schedule referred to in these letters patent and making part of the same containing a description in the words of the said James MacGregor, Junr., himself of his improvement, being a machine for jointing, tonguing, grooving and planing plank for flooring houses and for other purposes.

[In margin:]

Disclaimer entered, 10 May, 1839.

Be it known that I, James MacGregor, Junr., of Wilton in the County of Saratoga and State of New York, have invented a new and useful improvement in the machine for jointing, tonguing, grooving and planing plank for flooring and sidings for ceiling, which is described as follows: —

1. The frame containing the jointing saws consists of four girths and two cast iron side pieces fastened together by joint bolts passing through the sides; the top of this frame is not quite as high as the top of the way hereafter described.

2. The frame containing the grooving and tonguing saws and plane (hereafter described) consists of two cast iron sides and six girths; three of these girths are above and three below the way. From the girths above to those below are fixed studs on either side of the way to which are attached cross bars fitted for the way to rest on.

3. The way on which the timber traverses is sixteen inches wide except between the jointing saws and between the saws for cutting the tongue and those that cut the groove at these places; it is only four inches. In the top of this way the whole distance is a groove for the chain to turn in for carrying forward the plank between the saws. Forward of the jointing saws, the way extends fifteen feet from the jointing saws to the tonguing and grooving saws: it is fifteen feet long; from this place to the wheel on which the chain gears back of the frame it is seven feet long.

This way must be secured on rests so that it will not be liable to get out of place. Beyond the end of the machine the way is continued fourteen feet more.

4. The gauges on the way to guide the plank, the gauges on the side farthest from the plane shaft, are made permanent and parallel with each other; the one forward of the jointing saw is a fourth of an inch farther from the centre of the way than the one after the jointing saw. The jointing saw is set to correspond with the gauge that is after it. Behind the saws that cut the tongue the gauge rests on top of the tongue to keep the plank from rising between the roller before and the one after the plane and against the main shoulder above the tongue, to guide the plank straight; this gauge is sharp at the forward end, and shaves off the edging that is above the tongue.

The gauges on the other side are movable so as to suit any width of plank. In front of the jointing saw is a weight to keep the plank up to the stationary gauge. Behind the jointing saw the gauge is as thin as possible and is set in a line with the saw. From the saws that

cut the groove to the back part of the frame the shoulder of the gauge is as thick as the under flange that forms one side of the groove. The edge of the flange presses against the shoulder to guide the plank straight through the machine. Above this shoulder on the gauge is a tongue that enters the groove to keep the plank from rising between the rollers.

5. The jointing is done by two circular saws; the one on the side farthest from the plane shaft is so placed as to cut the edge off in a line with the gauge that lies immediately after it, the one on the other side is placed in a movable carriage operated by a graduating screw so that it can be set to any width desired.

6. The tongue of the board is formed by four circular saws; the two placed on the perpendicular shaft have a chuck between them as thick as the intended tongue. This shaft is so placed that the two saws cut horizontally into the edge of the plank as far as the width of the intended tongue. Above and below the plank is a shaft placed horizontally with one saw on each: the one above cuts down to the cut made by the upper horizontal saw, the one below cuts up to the lower cut made by the lower horizontal shaft. These two last-mentioned shafts are so placed that the saws cut into the face of the plank as far from the outer edge as the tongue is designed to project.

7. The groove is formed by three circular saws placed on perpendicular shafts turning horizontally in the same carriage or frame, which carriage or frame is so constructed that it may be moved back or forward by a regulating screw to suit any width of plank to be dressed. On one of these shafts are put two circular saws, having a chuck between them of such thickness that the saws from outside to outside will be as far apart as the width of the intended groove; the other shaft carries one saw made thicker than the two just mentioned and so placed that it clears out the timber between the cuts made by the before-mentioned saws.

8. The revolving circular plane is made in the following manner: The shaft is of cast iron with a cast steel step fitted in its lower end and a cast steel bearing about six inches in length fitted in its upper end to admit the shaft to rise and fall without disturbing the upper box. Eight cast iron arms project from this shaft; at the extremities

of these is a circular cast iron rim projecting three quarters of an inch below the arms, even with the under surface of which rim is a flange projecting horizontally one and a half inch, the under side of which flange and rim is turned true, forming a smooth surface to pass freely over the plank to be planed. In this flange are sixteen slots forming throats to admit the inner edges of the plane irons, at the back part of which slots are projections extending from the top of the rim as far as the outer edge of the flange to which they are cast solid, having the same inclination as the irons. These projections form the back part of the slots as well as the bed pieces on which the plane irons rest and are fastened by screw bolts and nuts — each plane iron is four inches long and two inches wide, rounded on the outer corner, the front edge passing through the throat being nearly square. This edge the outer corner and up the outer edge as far as the plank should ever exceed the desired thickness is made sharp. To support this revolving plane, a bar extends from one girt to another, directly under the centre of the shaft below the way. On this bar is fastened a box to receive the step placed at the lower end of the revolving plane shaft. A plate forming the stationary part of this box is twelve inches long, four inches wide, with a rise in the centre four inches high and four inches in diameter, thro' the centre of which is drilled an aperture two inches in diameter in a line with the centre of the shaft. In this aperture is fitted a piece of metal having a cavity in its upper end to admit the point of the shaft, and is made to rise and fall by a regulating screw to elevate and depress the plane at pleasure; the side of the rise is tapped and a screw fitted in so as to press against the side of the slide to keep it stationary when required.

9. The feeding is performed by an endless chain passing over two wheels, one at the end of the frame in which the revolving plane is placed and the other at the first end of the way; the first mentioned wheel has cogs on its periphery working in the links of the chain. On this chain are fastened hooks which lay hold of the end of the plank on the chain carrying it forward to the saws and plane.

10. Rollers for holding down the plank: there are three of these rollers, one placed in front of the jointing and tonguing saws, one

between these and the plane, and the other behind the plane, all held down upon the plank by weights and levers to confine the plank on the way.

11. The pulleys and bands on each of the shafts of the saws, and on the shaft of the revolving plane is fixed a pulley.

Another pulley is put on the feed shafts lying across the frame below the way; a pulley is fixed on a shaft at the after end of the frame; on this shaft is a small cog wheel working into a large cog wheel on the shaft of the wheel carrying the endless chain. A large pulley or drum and a loose pulley are placed under the way and at right angles with it between the two frames. A band passes around each pulley and around the large drum for driving the jointing saws, tonguing and grooving saws and the revolving plane. The band which drives the feeding pulley passes around a small pulley on the shaft of the main drum. The driving pulley is also placed on the shaft.

Operation. The machine being put in motion by steam or water power, the plank to be dressed is placed on the way in front of the jointing saws and carried forward by the motion of the endless chain to these saws which joint its edges; it is then carried forward to the tonguing and grooving saws passing under the rollers between the gauges where it is tongued and grooved in the manner hereinbefore described; the endless chain then carries it forward to the circular revolving plane, when it is planed smooth by the operation of the plane in the manner also hereinbefore described.

The plank is then conducted out of the machine by the continued motion of the endless chain. The jointing may be performed in a separate machine. Also the tonguing and grooving. And the planing likewise may be done in a machine distinct from the others, but all operated on the same principle as herein described. Rollers may also be fixed before and after the jointing saws, to keep the plank firmly down upon the way.

Now what I, the said James MacGregor, Jr., claim as my invention and for which I solicit Letters Patent from the Government of the United States is, 1, The planing of timber of any size or dimension by the principle of the turning tool and plane iron united as before

described, or by the turning tool separate from the plane iron, or so near as to retain the same principle. 2. The application of the sliding box for the step of the revolving plane shaft to turn in, and by which the revolving plane is raised and lowered to give the desired thickness to the plank made and applied as before described. 3. The passing the shaft through beyond the face of the revolving circular plane so as to have a step for the plane to rest on. 4. The application of the gauge under the plane to keep the stuff down while the plane is operating; this may be done by a roller, but I prefer the gauge. 5. The application of the common circular saw to joint tongue and groove plank or siding in the manner before described. 6. The mode of forming a tongue on a board plank or siding by cutting in the edge of the plank horizontally on each side of the tongue and then vertically to form the shoulders by circular saws as hereinbefore described. 7. The mode of forming the groove by making two horizontal cuts in the edge of the plank with two circular saws as far apart and as deep as the width and depth of the intended groove and clearing out the timber between these cuts by a circular saw revolving horizontally in the manner herein described.

Further to illustrate my invention I refer to the model and drawing of the same deposited in the Patent Office.

In testimony whereof I hereunto subscribe my name this 19th day of August 1833.

Witnesses: JAMES MACGREGOR, Junr.

William P. Elliot,

P. S. Loughborough.

Ex'd. —I.R.

[Written in pencil:]

(Dr. in portfolio.)

DEFENDANT'S EXHIBIT Az.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED WILLIAM THORN AND JAMES THORN, JR., NO. 768, DATED JUNE 7, 1838.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas William Thorn and James Thorn, Jr., of Plainfield, N.Y., have alleged that they have invented a new and useful improvement in the machine for shaving shingles, which they state has not been known or used before their application, have made oath that they are citizens of the United States, that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said William Thorn and James Thorn, Jr., their heirs, administrators or assigns, for the term of fourteen years from the seventh day of June, one thousand eight hundred and thirty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said William Thorn and James Thorn, Jr., in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this seventh day of June in the year of our Lord one thousand eight [L.S] hundred and thirty-eight, and of the independence of the United States of America the sixty-second.

JOHN FORSYTH, *Secretary of State.*

Countersigned, and sealed with the seal of the Patent Office.

HENRY L. ELLSWORTH,
Commissioner of Patents.

WM. AND JAMES THORN, JR., OF PLAINFIELD, NEW JERSEY.
LETTERS PATENT, NO. 768, DATED 7TH JUNE, 1838.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that we, William Thorn and James Thorn, Jr., of Plainfield in the County of Essex and State of New Jersey, have invented a new and useful machine for shaving, tapering and edging shingles, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification: the frame of this machine is made oblong, of suitable size and strength to contain and support the several parts of the machine hereafter described.

The annexed drawing A, figs. 1, 2, 3 and 4, represents one composed of four posts, two caps, four girts and two inclined side rails, mortised, tenoned and pinned together.

Above this frame, towards the feeding end from the centre, are arranged three horizontal rollers, B, B, B, parallel with each other at the required distance apart, whose gudgeons turn in the lower part of oblong apertures in vertical standards, C, C, C, C, C, C, mortised and tenoned into the caps having blocks over said gudgeons which rise and fall in spaces in the upper parts of said standards, spiral springs being placed in said spaces above said blocks. The surfaces of these rollers are roughened by fluting or otherwise, and their gudgeons on one side of the frame project beyond the sides of the standards sufficiently far to receive spurred or cogged wheels, D, D, D, by which they are turned. These rollers are called the bearing and drawing rollers. Under said bearing rollers are arranged 7 supporting rollers, E, E, E, E, E, E, E, fig. 4, two under each, whose gudgeons turn in the caps of the frame, and one under the cutting cylinder. The shingle to be planed passes between these bearing and supporting rollers, and is drawn forward by the fluted bearing rollers. Between the first pairs of supporting rollers (near the feeding end of the machine) is placed the cylinder of cutters F, for planing the

under side of the shingle. This consists of a horizontal axle extending across the frame and turning in the caps; on it are fixed two round heads with bars extending from the one to the other, to which the cutters are fastened by screws or other means. On the axle is likewise fixed a pulley, G, fig. 1, around which passes a band, H, fig. 3, leading to a pulley, I, turning on a spindle, inserted into one of the posts near the bottom thereof, around which pulley passes another band, J, leading to the main drum K, fixed on an axle turning in boxes, on the inclined rails near the discharging end of the machine for revolving said cutters. Above the frame, between the second and third drawing rollers, is placed the revolving cutter L, for tapering and planing the upper side of the shingle. This is made like the wheel of cutters for planing the under side of the shingle just described. Its gudgeons, however, turn in movable uprights, M, M, which rise and fall in cutting the taper of the shingle, by means of a wheel with eccentric grooves. The movable uprights are connected together, or near the centre, by a cross-piece, N, fig. 3, from which cross-piece projects downwards two pieces, O, O, one on each side of the eccentric wheel, between which it turns without touching — one of which O′ is forked to allow it to embrace the axle of the eccentric wheel without touching it — see also fig. 6.

In this forked piece are made a row of holes, P, to correspond with the eccentric grooves through which is passed horizontally a pin, Q, that enters the eccentric groove of the wheel. From the edge of the forked piece, near its upper end, projects horizontally at right angles to the same and lengthwise of the frame, an arm, R, extending to the feeding end of the machine, from which rises vertically an index pin, Y, passing through a round aperture in one of the top girts of the frame for indicating the position of the cutting cylinder, and the time to introduce a shingle. The lower ends of the movable uprights are made round with shoulders; the round parts pass through round apertures in braces, T, T, fastened to the under side of the caps, for steadying them as they rise and fall with the cylinder of cutters; said cylinder of cutters is turned by means of a band, U, fig. 1, passing round a pulley, V, on its axle leading to the main drum K. The vertical movement of the cylinder is effected by means of a

wheel, W, with parallel eccentric grooves, X, fig. 4, in its face into which the pin Q of the forked piece O′ enters, and as the wheel revolves the side of the eccentric groove into which the pin is placed presses against the under side of said pin, which causes it to rise with the cross-bar N, movable uprights M, and cylinder of cutters L. The descent of the same may either be effected by the pressure of the other side of the groove upon the upper side of the pin, or by gravity. The wheel containing the eccentric grooves is represented at fig. 4; it is fixed on a horizontal axle turning in boxes on the inclined rails, having a pulley, Y, figs. 1 and 3, on one of its ends, around which passes a band, Z, leading around a small pulley, *a*, on the end of the axle of the drum K. On the other end of this eccentric wheel axle is another pulley, *b*, fig. 3, around which passes a band, *c*, extending around the pulley D on the ends of the axles of the drawing rollers B. The pin of the forked piece is changed from one hole to another, and its corresponding eccentric groove of the wheel, according to the length of the shingle to be shaved. When the longest kind of shingle is to be shaved, the pin must be placed in the groove farthest from the centre, and when the shortest kind are to be dressed, the pin must be put into the groove nearest the centre. In the rear of the horizontal wheel of the cutters are arranged two vertical wheels of the cutters *d′*, *d*, for jointing or taking off the edges of the staves, placed about the width of the shingle apart. They are both fastened to the upper ends of vertical axles, *e*, *e*, on which are pulleys, *f*, *f*, with bands, *g*, *g*, fig. 5, leading around them to the main drum K for turning said wheels of cutters.

The axle *e*, on the left, turns in round apertures in projecting pieces of the frame, shoulders being formed on it to prevent its falling too low. The axle *e*, on the right, turns in the ends of two horizontal parallel pieces, *h*, *h*, united in the centre by a cross-piece, *i*, having a round vertical rod *j*, passed through the ends opposite to those containing the axle, which rod is fastened to the main frame near one side thereof, on which rod this small cutter frame vibrates to the right or left, in order to set said cutters on the right nearest together or wider apart, according to the width of shingle to be jointed.

These cutters are pressed against the shingle by means of a spring,

k, or weight, and receded from it by means of an angular gauge lever, *l*, vibrating on a pin, *m*, passed through one of its ends into the top of the frame; its other end, *n*, being curved inward toward the centre of the frame, and against which the edge of the shingle bears as it is introduced into the machine. The vibrating cutter frame is attached to this vibrating lever by a pin, *o*, near the centre thereof. On the top of the left side of the frame, at the feeding end, is fastened a rest, *p*, fig. 1, with a straight edge against which the edge of the shingle moves.

The spring or weight crowding the gauge lever against the other edge of the shingle, the left jointing cutters turn in a cavity in the end of the rest *p*, near the periphery of the right wheel of cutters, and toward the shingle is placed a vertical guard, *r*, fig. 1, 3, 5, parallel with the axle of said cutter wheel, for the purpose of preventing the cutters entering too far into the edge of the shingle. On the top of the frame, in the rear of the last drawing roller, is secured a horizontal board or table, *s*, of sufficient length and breadth, furnished with off parallel side ledges for conducting the shingle after being finished at the end of the machine.

It may be well to mention that the cylinder of cutters, for giving the taper to the shingle, may receive its vertical movement as it revolves, by means of a horizontal sliding board, having on one of its sides parallel oblique grooves into which the pin of the forked piece may be placed.

Also that the gearing may be by means of cog-wheels, straps, chain wheels or bands, or any suitable gearing known to mechanics.

And that the main drum may be turned by the power of steam, horse, or any convenient power.

And that the movable jointer may be moved by a spring-slide, with notches or screws. The operation of the machine is as follows:

The pieces of wood being properly prepared for the shingles, and the machines set in motion, one piece is introduced at a time between the rollers B, E, which draws it forward. The spring-guide *l* presses it against the rest *p*, and as it is drawn through between the rollers, the first or lower cylinder of cutters F dresses the under side of the shingle, and when it arrives at the second or upper cylinder of cutters

L, the operation of tapering and dressing the shingle takes place, the cylinder being at its greatest elevation.

The cutting commences at the forward or butt end of the shingle, and as it advances the cylinder of cutters descends gradually by the action of the eccentric groove-wheel W, and cuts away the shingle to the point of the same, and thus forms the taper.

As soon as it leaves this cylinder of cutters, it is met by the revolving jointing cutters *d*, which take off the edges. It is then carried forward between the last rollers B, E, and delivered upon the table *s* at the rear end of the machine, from which it is pushed off by the next shingle that is introduced, and so on.

The attendant having observed the index pin *y*, in order to ascertain the exact position of the upper cylinder of cutters L, another piece of wood for another shingle must be introduced, and dressed in a similar manner to the last. Should pieces of wood of a greater width be introduced, the end of the gauge lever *l*, to which the right jointing cutter cylinder *d'* is attached, must be extended from the gauge-board, in order to admit the shingles, and of course the said jointing cutters are extended at the same time. The spring or weight will keep it against the edge of the shingle, and the guard *r* will prevent the cutters entering too deep.

The invention claimed and desired to be secured by letters patent consists in the combination and arrangement of parts for giving the horizontal revolving cylinder of cutters a simultaneous vertical movement as the shingles is drawn between the rollers, by which it is made to receive its proper taper in the manner before described.

Also the combination and arrangement of parts for jointing shingles of different widths in the manner before described.

WILLIAM THORN.
JAMES THORN, Jr.

Witnesses,
Cornelius Boice.
Trustum Manning.

Ex.—J.A.W.

DEFENDANT'S EXHIBIT Ay.—D.B.H, Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED GEORGE L. DAY, NO. 317, DATED JULY 29, 1837.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas George L. Day, of Union, New York, has alleged that he has invented a new and useful Improvement in the machine for dressing or smoothing, sawed shingles, siding and other similar stuff, which he states has not been known or used before his application; has made oath that he is a citizen of the United States that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying, that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said George L. Day, his heirs, administrators or assigns, for the term of fourteen years from the twenty-ninth day of July, one thousand eight hundred and thirty-seven, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of said George L. Day in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made Patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-ninth day of July in the year of our Lord one thou-
[L.S.] sand eight hundred and thirty-seven and of the independence of the United States of America the sixty-second.

JOHN FORSYTH,
Secretary of State.

Countersigned and sealed with the seal of the Patent Office.

HENRY L. ELLSWORTH,
Commissioner of Patents.

The schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, George L. Day, of Union in the County of Broome and State of New York, have invented an improved machine for dressing or smoothing sawed shingles, and siding and other stuff of a similar kind, and that the following is a full and exact description thereof:—

In the accompanying drawing, fig. 1 represents a front view of the machine, and fig. 2, a top view, the same letters of reference in each of the figures serving to designate the same parts. The dressing is to be effected by cutters placed upon a cutter wheel revolving vertically, having gouge-formed knives upon its face. *a*, *a*, *a*, represents the frame work of the machine, *b* is a shaft to which the propelling power is to be applied: a band wheel *c*, upon this shaft carries the shaft *d*, of the cutter wheel by means of the whirl *e*; *f*, is the cutter wheel, and *g*, *g*, cutters on its face, in such number as may be preferred; *h* is a guide piece or support against which the shingle, &c., is to be pressed by means of the outer guide rollers, serving like the face of a plain, to sustain the stuff as the cutter operates upon it, the cutters being set more or less rank, according to circumstances; there is also a vertical piece, *i*, affixed to the frame, outside of the cutter, which performs the same office without the cutter that the curved piece *h* performs within it.

The feeding rollers, j, j, are in pairs, the hind ones simply revolving on their gudgeons, whilst the fore ones have their gudgeons in slots, and are borne up by springs K, K, so as to press upon the sawed shingles or other article to be smoothed and which is to feed in between them. To give motion to the feeding rollers, there is a whirl, l, on the first horizontal shaft b, a band from which passes round a wheel, m^1, on the second horizontal shaft m^2; this shaft carries a pinion, n^1, that takes into the crown wheel n; on the vertical shaft o^1, o^2 is a similar shaft, receiving its motion from o^1, by a band p, upon whirls q, q.

Upon the upper end of the shafts o^1, o^2, there are pinions r^1, r^2, which gear into the pinions s^1, s^2, s^3, s^4, upon the upper ends of the back feed rollers serving to drive them, and consequently to feed the stuff to the cutters.

As the relative motion of the respective parts is a point of considerable importance in the due operation of those machines, I will state the dimensions of certain parts which after numerous experiments I have found to answer well in practice. The band wheel c is twenty inches in diameter, the whirl e, five inches, the cutter wheel, eighteen inches. The whirl l, six inches, the wheel m^1, eighteen inches. The pinion on the second horizontal shaft has six leaves, and the crown wheel n, sixty teeth.

The pinions r, r, s, s, are equal in size, and the rollers j, j, one inch and a half in diameter.

I do not claim to be the inventor of cutter wheels, feeding rollers, or any of the other parts of the within-described machine taken individually. But what I do claim is the particular manner in which I have combined and arranged the feeding apparatus, with the cutter wheel, for the dressing of shingles, siding and other similar stuff.

GEORGE L. DAY.

Witnesses,

THOS. P. JONES,

ISAIAH P. ROBBINS.

Ex'd.—J.R.

DEFENDANT'S EXHIBIT Ax. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED REUBEN MURDOCK, NO. 6523, DATED JUNE 12, 1849.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Reuben Murdock, of Rochester, New York, has alleged that he has invented new and useful Improvements in Barrel Machinery, which he states have not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvements, and that the same have not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvments, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Reuben Murdock, his heirs, administrators or assigns, for the term of fourteen years from the twelfth day of June, one thousand eight hundred and forty-nine, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvements, a description whereof is given, in the words of the said Reuben Murdock, in the schedule hereunto annexed, and is made is part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twelfth day of June in the year of our Lord one thousand eight hundred and forty-nine and of the independence of the United States of America the seventy-third.

[L.S.]

T. EWING,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent Office.

THOS. ENBANK,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Reuben Murdock, of Rorchester in the County Munroe and State of New York, have invented certain new useful Improvements in Machinery for manufacturing Staves, whereof the following is a full, clear and exact description, reference being had to the accompanying drawings, in which figure 1 is a side view of the cross cutter; figure 2 an elevation of the sawing machine; fig. 3 a plan of the same; figure 4 a view of the carriage reversed to show the feeding apparatus; figure 5 a side view of the saw frame; figure 6 a side view of the dresser; figure 7 a plan of the same; figure 8 a side view of the jointer; figure 9 a plan of the same; figure 10 a cross section of the same, at the line x, x of figure 9; fig. 11 is a view of the bottom of the carriage of the jointer, and fig. 12 a vertical longitudinal section of the same at the line 1, 1, of fig. 11.

(Note. — The letters referred to throughout this specification are in red ink on the drawings, those in black ink being referred to in the old papers.)

The object of my improved machinery is the production of a smooth stave having both its cross and longitudinal sections correctly curved, and the edges correctly beveled and jointed, so as to fit it for the hoops.

My stave machinery is composed of four members.

The first receives the plank from the saw mill and cross-cuts it

into slabs equal in length to that of the intended stave. The second saws the slab lengthwise, producing a stave curved both transversely and longitudinally. The third joints its edges, giving them their proper bevel, and tapering the stave from the centre in each each direction to the ends. The fourth dresses the stave smooth on both sides.

The cross cutter (fig. 1.) has a horizontal bench or frame, A, firmly secured to the floor of the building. This frame is crossed by friction rollers, *a*, *a*, whose peripheries project above its upper surface, and at one end is secured the gauge-bar B, projecting above the friction rollers. The saw frame C is suspended above the bench, and swings across it; this saw frame is formed of two side picees, *b*, *b*, connected by suitable cross ties and braces, is suspended from a horizontal shaft D, and descends to within a short distance of the top of the bench.

At the lower extremity of this swing frame is the horizontal shaft E of the circular saw F, whose plane of motion is at right angles to the length and surface of the bench.

A belt pulley, *e*, is mounted on the saw shaft, and a corresponding one on the shaft of the swing frame, these two being connected by a belt; and a second pulley, mounted on the shaft of the swing frame, receives motion from the driver.

The position of the saw with respect to the gauge-bar is such that the distance between them shall be equal to the length of slab required.

To use this machine, swing the saw to one side of the bench, shove on the plank endwise, until the shortest portion of its irregular extremity is opposite the edge of the saw, then press the swing frame towards the plank; as soon as the saw touches it will commence cutting the plank, and by the continued pressure will pass transversely though it, cutting off a block, and thus squaring the end of the plank. The plank is now shoved endwise, until the squared end touches the gauge-bar, when the saw frame is again swung across the bench, cutting off a slab equal in length to the distance between the gauge and the saw; the swing frame being withdrawn and the sawed slab removed, the plank is again shoved endwise against the

gauge, and the operation continued as before, until it is entirely cut up into slabs.

The slabs are then fixed to a carriage moving in a circular arc, and subjected endwise to the action of an oscillating curved saw, whose plane of oscillation passes through the radius of the arc, and is at right angles with the plane in which the carriage moves. In figs. 2 and 3, G represents the curved frame of the machine to which the other portions are attached. To the top of this frame are attached two circular railways *d*, *d'*, concentric with each other. To the inner side of the bench are secured the supports *e*, *e'* of the saw shaft H. On this shaft is mounted the saw frame I, formed of two radial arms, *f*, *f'*; to the lower, the lower extremity of the curved saw J is firmly secured. The upper extremity of the saw is clamped to the upper arm *f* of the saw frame by a spring plate, *g*, secured by two screws, *h*, *h*, the saw ends in a tongue which passes between the screws; the spring clamp presses on the whole width of the saw, thus securing it more perfectly than if it was merely screwed to the frame; at the same time the elasticity of the spring plate allows a little play in the saw, which in fast motions prevents the fracture of the saw blade at the edge of the frame. The radius of the saw's longitudinal curvature is one eleventh longer than the radius of the barrel at its largest part. The saw has also a curved cross section, the curve of which is the same as that of the stave in the direction of its length. The back of the saw moves in a vertical plane; the cutting edge has a rake of about one fourth of an inch, the upper extremity of the saw being that much wider than the lower. An oscillating motion is given to the saw by connecting its frame by a pitman, K, with a crank, L, on the extremity of a horizontal shaft, M, beneath the circular railways.

On railways *d*, *d'* runs the feed carriage N, having the form of a segment of a ring, whose inner edge just clears the saw. The slabs form the cross cutter are secured to the top of this carriage by introducing their ends between two revolving dogs, *i*, *i*, situated at the opposite extremities of the inner edge of the carriage; above the inner edge of the carriage is the bar *j* supported on standards, K, and by which the upper extremities of the axes of the dogs are sup-

ported. A direct motion is given to the carriage by an endless screw, O (attached to the frame G), working in a rack, P, attached to the carriage. To produce a retrorgade motion the screw is disengaged from the rack by the lever *l* acting on its axis, and the carriage is brought back to its first position by a descending weight, the strap of which passes over a pulley at the end of the frame G, and is attached to the carriage. The endless screw is on a shaft, Q, parallel with the crank shaft M of the saw, and receives motion from it by a belt. The belt pulleys are reversed cones, so that the speed of the carriage can be regulated according to the toughness and hardness of the wood. In order to cut consecutive staves from the same slab, a rotary motion must be given to the revolving dogs. The arrangement for this is beneath the bottom of the carriage, and is as follows: a ratchet wheel, *m*, is attached to the axis of each dog, against the ratchet teeth; the pawls *n* are pressed by the springs *o*. The opposite extremities of these pawls are connected with a vibrating lever, R, at equal distances on the opposite sides of its axis P. This lever extends transversely across the carriage and projects beyond its outer edge; the projecting arm by the motion of the carriage cones in contact alternately with the pins *q*, *q'*, attached to the frame. By the pin *q* it is kept stationary during the last portion of the direct motion of the carriage, and the pawls fastened to the lever are drawn towards each other, their outer extremities slipping over the inclined faces of the teeth of the ratchet wheels *m*, *m*. In the retrograde motion of the carriage the projecting arm of the lever comes in contact with the pin *q'*, and the pawls being moved from each other catch in the radial edges of the ratchet teeth, and revolve the dogs in opposite directions, thereby forcing the slab towards the saw. It is evident that as this movement of the slab takes place before the retrograde motion of the carriage is completed, it will be pressed violently against the saw, and if the carriage could not move outwards from the saw, a breakage must ensue. To obviate this difficulty, I allow the carriage in its retrograde motion to move a sufficient distance outwards from the saw, to allow the slab to clear it, and when the end of the slab, by the completion of the retrograde motion of the carriage, has passed the saw, the carriage

is pushed into its proper position for sawing the stave, by the action of the lever *l*, which throws the endless screw O into gear with the rack. I prefer to have the timber sawed at the mill into four-inch plank, and the axis of my saw shaft is about half that distance above the plane of the top of the feed carriage. To prevent accidents, I attach a guard, S, to the support *e'* of the saw shaft preceding the cutting edge, and through this guard the slab passes to the saw. A curved case, T, is attached to the frame G, immediately following the saw, to receive the sawed stave. In this case are two inclined gates, *r*, *r*, pressed against the back of the case by weights or otherwise. These serve to steady the sawed end of the stave, and prevent it from falling when detached from the slab, and in this case it remains until pushed out by the succeeding stave. In order to introduce the sawed slab between the dogs, the pawls *n*, *n*, are disengaged from the ratchet teeth by the levers U whose longer arms extend beyond the carriage; the slab is then presented to the dogs, which are turned by applying a wrench to the upper extremities of their axes which project above the bar *j*, and are squared. The dogs are thus turned until the slab is in the proper position to receive the first cut of the saw. The thickness of the stave may be varied by altering the pitch of the teeth of the ratchet wheels *m*.

The sawed stave next proceeds to the jointer, figs. 8, 9 and 10. The operation here effected is giving the proper bevel to the edges of the stave, at the same time tapering its breadth in each direction from the centre. This is performed by attaching the frame to a reciprocating carriage, and passing it endwise between two circular saws whose planes of motion are inclined to each other. The carriage Y is composed of a block, curved both lengthwise and crosswise to correspond with the inner surface of the stave, and of a flat bottom running on ways beneath the saws, and which from its position can be made sufficiently wide to ensure stability and prevent the vibrating motion which would result from a too narrow support.

The stave is secured to the carriage at the end first passing the saws by a self-acting dog, S. This is formed of a plate, *a''*, turning at one end on a pivot, by which it is attached to the carriage. A notch, *b''*, is made in the upper edge of the plate, above the pivot, to

receive the end of the stave, and a second notch, c'', is made in the lower edge, below the pivot, in which catches the spring detent d'' attached to the bottom of the carriage. By this detent the dog is held against the stave. The projecting arm of the dog is inclined downwards, and slotted, e'', at the end of the carriage last passing the saws at standard W is secured, to the upper extremity of this standard is attached a spring, t, projecting downwards, and having a shoulder, x, near its lower extremity, beneath which the end of the stave is received. The carriage runs on a horizontal bench, X, to which the other portions of the machine are secured, and receives a reciprocating motion from a rack and pinion or other analogous device. By this motion it is propelled between the inclined faces of two circular saws, u, u, whose planes of motion meet below the centre of the carriage. The saws are directly opposite each other, and act simultaneously on the opposite edges of the same stave. The bottom of the carriage moves in a horizontal plane, and as its upper surface is higher in the middle than at two ends, it is obvious that the parts of the stave resting on this portion of the carriage, must pass between the saws at a point where, from their inclined position with respect to each other, their cutting edges are further apart than they are at the points where the ends of the staves pass between the saws; and if the saws be inclined to each other at an angle equal to that formed by the opposite beveled edges of a stave, it is obvious that the edges of a stave subjected to the machine will be suitably beveled and jointed to make a tight joint when the staves are put together. To increase or diminish the bilge of the staves the top of the carriage must be made more or less crowning. After the stave, by the direct motion of the carriage, has cleared the saws, the arm f'' of the detent striking a pin, v, at the end of the bench withdraws it from the lower notch of the dog; at the same time the slot in the projecting arm of the dogs, coming in contact with the pin, v, is depressed, and that end of the stave being liberated, the spring, t, at the opposite end of the carriage ejects it from the machine. The carriage is then retrograded, and another stave is applied.

The jointed stave is then introduced in the dresser. This resembles a planing machine with a cylindrical cut, and is represented in

figures 6 and 7. Two sets of cutters, A′, A″, are mounted on two shafts, *a′*, *a″*, parallel to each other. The cutters of each set have their edges curved, the curve of one set being concave, to smooth the cylindrical exterior of the stave; the other set having their cutting edges curved, to dress the interior curve of the staves. These two sets of cutters revolve in opposite directions, and are driven by belt pulleys, B′, B″, mounted on their respective shafts. These shafts are at such a distance from each other that the space between the cutting edges shall be equal to the intended thickness of the finished stave. The staves are propelled between the revolving cutters by pressure feed rollers, C′, C″, one set of which, C″, precedes the cutters, while the second, C′, follows them. The position of the shaft of one roller of each set is not changed by the action of the machine. The other roller rises and falls upon the first, to adapt itself to any inequalities in the sawed stave and is pressed upon the stave's surface by springs, D′, D″. As the sawed stave has a curved cross section, it is necessary that the shape of the feed-rolls should correspond with it, and accordingly one roll of each set is made bulging and the other is hollowed, corresponding, also, in this respect, with the convex and concave curves of the cylindrical cutters. The shafts of the feed rollers pass through the side framing of the dresser, and have pinions, E′, attached to them, by which the two rolls of each pair are connected together. The extremities of one roll of each set are connected by the wheels F′ F″ and pinion H′; motion is given to these wheels by the pinion I′, on whose shaft a belt pulley, J′, is mounted. To hold the stave firm during the action of the cutters, and to guide it into its proper position between them, spring rests are attached to the frame, the one set, K′, preceding the other, K″, succeeding the cutters, each set being as near as possible to the cutting edges. Each set is composed of two bars, the one, *d′*, fixed, the other, *e*, rising and falling on the first, towards which it is strongly pressed by springs, L′, so as to hold the stave perfectly firm during the action of the cutters. The sawed staves are introduced through one set of feed rollers, C″, and passing through the spring rests and between the cutters are thrown out by the other set of feed rollers, C′, perfectly smoothed. This same

dressing machine may be used for dressing sawed hoops by making a slight variation in its several parts. The advantages of my stave machinery over those previously constructed, result from the arrangement of machinery by which the several processes are produced, which are such that wood of any quality subjected to it may be cut into staves and delivered in a smooth and finished state. The several portions of each machine are perfectly simple, and from their position can be easily kept in repair, while the unprecedented rapidity with which the work is performed renders it far superior to any previously invented.

What I claim as my invention, and desire to secure by letters patent, is, —

First. I claim the combination of the revolving dogs (m), the pawls (n), the disengaging levers, U, the vibrating feed lever, R, and the stops, q, q', whereby the slab is secured on the carriage and successive staves sawed from the same slab.

Second. I claim disconnecting the carriage (N) from the feed gear during its retrograde motion, while the slab is being fed towards the saw (J), substantially in the manner and for the purpose herein set forth.

Third. I likewise claim the combination of the oscillating saw (J), with the curved gated case (T), whereby the stave is securely held during the action of the saw, in the manner and for the purpose herein set forth.

Fourth. I likewise claim the combination of the stave carriage Y with the spring dog s and spring hold fast t and stop v, whereby the stave is securely held down during the action of the saws, and then thrown from the machine.

Fifth. I also claim the combination of the concave and convex pressure feed-rollers (c', c''), and the self-adjusting spring clamps or rests (K′, K″), with the concave and convex cutters (A′, A″), when the several members are arranged in the curve of the longitudinal section of the stave, as herein set forth. REUBEN MURDOCK.

Witnesses,

P. H. Watson,

E. S. Renwick.

Ex'd. I.R.

DEFENDANT'S EXHIBIT Aw. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED HARVEY LAW, NO. 5792, DATED SEPTEMBER 19, 1848.

[PUT IN EVIDENCE, PAGE 362.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Harvey Law, of Wilmington, North Carolina, has alleged that he has invented a new and useful Improvement in machinery for planing rived staves, which he states has not been known or used before his application; has made oath that he is a citizen of the United States, that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Harvey Law, his heirs, administrators or assigns, for the term of fourteen years from the nineteenth day of September, one thousand eight hundred and forty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Harvey Law in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this nineteenth day of September in the year of our Lord one
[L.S.] thousand eight hundred and forty
pendence of the United States of Au

ISAAC T

Acting Secretary of State.

Countersigned, and sealed with the seal of the Patent Office.

HENRY H. SYLVESTER,
Acting Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known, that I Hervey Law, of Wilmington in the County of New Hanover and State of North Carolina, have invented certain new and useful improvements in the apparatus for the dressing of staves for barrels, and other vessels of a like description; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings which make a part of this specification: —

My machine is so constructed as to dress the staves consecutively on both sides, and to adapt itself to any inequality in the piece to be dressed, whether winding or otherwise. The undressed staves are to be placed one upon another, in a trough or hopper, the floor of which is made to traverse back and forth, and is provided with a hook, that is borne up by a spring in such manner as to cause it to catch hold of the rear end of the lowermost of the pile of undressed staves, and to carry it forward towards the revolving cutters by which the dressing is to be effected. In the operation of dressing, it is first passed over a revolving cutter wheel, the cutters of which are convex in such degree as to adapt them to the curvature that is to be given to the inner side of the stave. Immediately above this cutter wheel there is a roller against which the stave is borne by means of four weighted levers, by which means it is dressed to an equal thickness as well as rendered concave on its lower side, the weighted

DEFENDANT'S EXHIBIT Aw. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED HARVEY LAW, NO. 5792, DATED SEPTEMBER 19, 1848.

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THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Harvey Law, of Wilmington, North Carolina, has alleged that he has invented a new and useful Improvement in machinery for planing rived staves, which he states has not been known or used before his application; has made oath that he is a citizen of the United States, that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Harvey Law, his heirs, administrators or assigns, for the term of fourteen years from the nineteenth day of September, one thousand eight hundred and forty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Harvey Law in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this nineteenth day of September in the year of our Lord one [L.S.] thousand eight hundred and forty-eight, and of the independence of the United States of America the seventy-third.

ISAAC TOUCEY,
Acting Secretary of State.

Countersigned, and sealed with the seal of the Patent Office.

HENRY H. SYLVESTER,
Acting Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known, that I Hervey Law, of Wilmington in the County of New Hanover and State of North Carolina, have invented certain new and useful improvements in the apparatus for the dressing of staves for barrels, and other vessels of a like description; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings which make a part of this specification: —

My machine is so constructed as to dress the staves consecutively on both sides, and to adapt itself to any inequality in the piece to be dressed, whether winding or otherwise. The undressed staves are to be placed one upon another, in a trough or hopper, the floor of which is made to traverse back and forth, and is provided with a hook, that is borne up by a spring in such manner as to cause it to catch hold of the rear end of the lowermost of the pile of undressed staves, and to carry it forward towards the revolving cutters by which the dressing is to be effected. In the operation of dressing, it is first passed over a revolving cutter wheel, the cutters of which are convex in such degree as to adapt them to the curvature that is to be given to the inner side of the stave. Immediately above this cutter wheel there is a roller against which the stave is borne by means of four weighted levers, by which means it is dressed to an equal thickness as well as rendered concave on its lower side, the weighted

levers being so arranged as to bear it up against the roller, irrespective of any inequality in the form of its sides. From this cutter wheel the stave is carried forward by means of holdfasts of a peculiar construction, and is made to pass under a second cutter wheel, the cutters of which have their edges concave, their form being such as to give to the outer side of the stave that degree of convexity which is required.

In the accompanying drawings, fig. 1 is a side view of my machine, fig. 2, a top view of it, and fig 3, a vertical section of it, from end to end, through its middle; A, A, is the frame of the machine, B, B, a trough or hopper, in which the undressed staves are to be placed one above the other, and from which the lowermost stave is to be taken and carried forward towards the revolving cutter wheels; *a*, *a*, *a*, represent undressed staves contained within the trough B, B. C, C, is a stationary floor, upon which the pieces *a*, *a*, rest beneath; there is a sliding floor, or follower, C′, C′; this follower may be made to traverse forward by means of a rack and pinion, and back again by means of a counteracting weight when the rack and pinion are thrown out of gear; the follower or sliding floor may however be moved by an endless chain, instead of by a rack and pinion, or by any of the known modes of effecting such motion. At the rear end of the follower C′, there is a latch or hook, D, that is borne up by a spring, *b*, so as to catch hold on the rear end of the lowermost stave, and to carry it forward towards the cutting wheels. This hook passes up through a slot or opening, *a′*, *a′*, along the middle of the stationary floor C, C. From the fore end of the follower the stave falls on to the stationary bed of the machine at E, and at the next advance of the follower it is carried forward by a hook or dog, F, that is attached to said follower, and, of course, traverses back and forth with it; *c*, *c*, are spring pieces that prevent the follower from carrying forward from the hopper more than one stave at a time. As the stave is carried forward by the dog F, it passes over the upper ends of two levers, G, G, which are weighted at H, and is forced under the roller I, placed immediately above the cutter wheel J, the convex cutters of which dress the interior of the stave, and also reduce it to an equal thickness, the roller I being adjustable so

as to determine said thickness. As the stave enters under this roller it bears upon the upper ends of the levers G, G, and raises the weights, H, sufficiently high to cause the stave to bear against the roller, and as the levers make pressure upon it, near its edges, they will adapt themselves to any wind or twist in the stuff. As the fore end of the stave leaves the roller I, it comes into contact with two other bearing pieces, K, K, which are borne up against it by weighted levers L; the pieces K, K, concur with the levers G, G, in pressing the stave against the roller I, until the first dressing is completed.

As the stave passes out from between the roller I and the cutter wheel J, it enters between two pairs of segmental tooth hold-fasts, M and N, the uppermost, M, of which, being suspended, fall upon it by their own gravity, whilst the lowermost, N, are drawn against it by a spiral spring, *d*, or by other adequate means.

These hold-fasts are attached to an independent sliding rod, O, O, as are also similar hold-fasts P, Q, in advance of them, the upper hold-fasts M and Q being attached to vertical arms, R and S, that rise from the rod O, for the purpose of sustaining them. These vertical arms pass through slots T, T, in the frame of the machine which serve to guide them correctly back and forth. The rod O, is not connected directly with the follower which advances the staves from the trough B, but still moves forward with it, in the following manner: The pinion U, which engages with the rack V, is to be driven by any adequate power, but the rack is of such length only as is necessary to advance the stave from the trough B, and to carry it towards the cutters.

The pinion has a clutch box on its shaft, which may be unclutched by means of the lever W, at the end of every vibration forward; the unclutching and clutching may be effected by the attendant, or mechanically by the aid of projecting pins or buttons, in a manner well known, the clutch box being of the ordinary construction. The follower is then drawn back by the counteracting weight X, preparatory to the advancing of another stave, for which purpose the pinion is again clutched. To the follower C, C, is attached a sliding rod Y, Y, which, of course, moves back and forth with it. This rod carries a second dog or hook Z, which, like the dog F, is to advance

the stave towards a cutter wheel *l;* the hook or dog Z, is hung on a pivot allowing it to be depressed, should it in its retreat be brought into contact with a stave that is passing over it. When the rod Y, Y, advances, it pushes forward the rod O, O, that carries the hold-fasts by means of a latch that temporarily connects the rods O and Y. When the latch that carries the rod O forward is lifted, said rod, with its hold-fasts, is made to slide back by means of a cord *e*, that has a weight *f* attached to it, the cord passing over a pulley *g*, fig. 2. In fig. 4, I have shown that part of the underside of the machine where the latch and its appendages are situated, say between the points *x*, *x*, of fig. 2. A latch *h*, is affixed to the rod O, O, and this falls on the catch piece *i*, attached to the rod Y, Y; when the rod Y, Y, advances, the rod O, O, with its hold-fasts, will necessarily be carried with it, but when the taper end of the latch comes into contact with a piece *j* attached to the frame of the machine, it will be lifted, and the rod O, O, will be drawn back by the weight *f*, and the hold-fasts be made to take a new hold on the staves which they are to carry forward; the teeth on them being so formed as to allow them to pass back readily, but to lay hold on the stave when it is to be advanced.

After a stave has cleared the first cutter wheel it is deposited on the bed of the machine forward of it as at K, K, and it is to be then advanced towards the second cutter wheel, which is furnished with concave cutters.

This wheel has below it a roller, *m*, upon which the concave dressed side of the stave is to be borne down. An upright sliding piece *n*, passes freely through mortises on each side of the frame, each of which sliding pieces carries a pressed roller *o*, that bears on the outer edges of the stave *p* (fig. 5), as it passes under the cutters, the slides being drawn down by weights *q*. Fig. 5 is a transverse view of the slides *n*, and their appendages. On the opposite side of the cutter wheel there may be like slides and pressure rollers; these are not shown in the drawing, it having been proposed to make another arrangement, as at *p*, for the same purpose, but that described is preferred. By means of the rollers *o*, *o*, the staves will be kept in

contact with the roller *m*, notwithstanding any twist that may be in them.

The staves, it will be seen, are not to be carried entirely through so as to free them from the cutters by the follower, but are by it left embraced between the rollers, whence they are to be taken by the hold-fasts; the staves are not dependent therefore for their forward motion upon one of them being made to push another forward, but are carried on independently of the follower, it being necessary that they should have free play to enable them to adapt themselves to the inequalities of form in split stuff; which end, under my arrangement, is effectually attained, the staves being lifted from the floor, and suspended, as it were, in the air whilst being dressed. To prevent any injurious deviation of the stave from its course as it passes along the machine, guide pieces *t*, *t*, *t*, may be placed at different parts of its course.

What I claim as new, and desire to secure by letters patent, is not the general manner of pressing the materials to be cut, away from the cutters and against the bearing supports, the same thing having often and long since been done by others; but I claim, in combination with the cutter, rest and follower, or any well known mechanical equivalent thereof, the separate supporting levers G, G, and L, L, acted on by weights H, H, one lever acting on each edge of the stave to produce separate and independent pressures near the two edges, holding it firmly against a single fixed piece or rest, immediately opposite to the cutters, but permitting all other parts of the stave, however crooked, twisted or variable in thickness, to pass free from constraint, and at full liberty to take whatever movements lateral and vertical its crooks and windings may require, whereby the dressing is allowed to follow the bendings and windings of the stave without cutting across the grain of the timber, and in combination with the parts above claimed. I also claim the segmental hold-fasts M, N, and P, Q, acting to draw the stave from between the cutter wheel J and roller I, and thereby prevent the irregular thinning away of its extremities; not intending in this claim to confine myself to the exact arrangement of parts herein described, but to vary the same at

pleasure while I attain the same ends by means substantially the same.

Witnesses, HERVEY LAW.

W. R. JOHNSON,

A. STEINWEHR.

EX.—J.A.M.

DEFENDANT'S EXHIBIT Av.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED EBENEZER WILSON, NO. 5472, DATED MARCH 14, 1848.

[PUT IN EVIDENCE, PAGE 362, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Ebenezer Wilson, Redding, Connecticut, has alleged that he has invented a new and useful improvement in machinery for dressing combs, which he states has not been known or used before his application; has made oath that he is a citizen of the United States, that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Ebenezer Wilson, his heirs, administrators or assigns, for the term of fourteen years from the fourteenth day of March, one thousand eight hundred and forty-eight, the full and exclusive right and liberty of

making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Ebenezer Wilson in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this fourteenth day of March in the year of our Lord one thousand eight [SEAL] hundred and forty-eight, and of the independence of the United States of America the seventy-second.

JAMES BUCHANAN,
Secretary of State.

Countersigned and sealed with the seal of the Patent Office.

EDMUND BURKE,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, Ebenezer Wilson, of Redding in the County of Fairfield and State of Connecticut, have invented a new and useful improvement in machinery for cutting combs, and quilling their backs, and that the following is a full, clear and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing and using the same, reference being had to the accompanying drawings making part of this specification, in which figure 1 is an isometrical view of the machine, and figure 2 represents details of the parts detached. The same letters indicate like parts in all the figures.

The nature of my improvement consists in the manner of holding and conveying the pieces of horn or other material to the cutters, and so constructing said cutters as to always preserve the same

diameter and form of moulding during the process of sharpening until the cutters are entirely worn out.

The construction is as follows: on a suitable frame (*a*) a table (*b*) is supported with the standards of the frame projecting above it; just above the table (*b*) a shaft (*c*) is situated, having its bearings in said standards: on this shaft there is a cutter head to be hereafter more particularly described, and also a pulley for driving it. The cutter head projects through the table, on the under side of which a groove (*d*) is cut, in a line with said cutter head, and into which it projects. A sliding carriage (*e*) is made to move back and forth under the cutter, its open side being guided by the groove (*d*) in which it slides; it is stayed on ways in the frame below to keep it in its place, and may be moved back and forth by hand, a handle (*f*) being shown in the drawing intended for that purpose.

In the upper surface of the carriage (*e*) there is a recess (*h*) formed, extending from side to side, into which the material (*i*) to be cut is placed, and by pushing forward the carriage the article (*i*) is carried into the groove (*d*) on the underside of the table, and is thus held firmly while the cutter is acting on it, and as soon as it is drawn out it is free and easily removed, and can be replaced by another.

This is a matter of great importance in such rapid and cheap operations, while the greatest accuracy is also insured: for while it is under the action of the cutter it is steadily held on all sides, although in short pieces.

The cutter is formed of a short cylinder of steel, on the face of which is twined any formed moulding or pattern suited to the purpose; in this cylinder at proper intervals notches are filed, forming cutters or teeth on the surface, and which cutters can be filed up sharp till the cutter wears out, the whole space between one notch and another. This will be so obvious on reference that it needs no further description.

Having thus fully described my improvement, what I claim as new, and desire to secure by letters patent, is the method of holding the material to the revolving cutter, without clamping, substantially as herein described, by inclosing said material on all sides, by the com-

bination of the recesses formed in the carriage and table through which the rotary cutter head projects, in the manner and for the purpose set forth.

EBENEZER WILSON.

FREDERICK OLMSTEAD, } Witnesses.
JARED OLMSTED, }

DEFENDANT'S EXHIBIT Au. — D.B.H., Special Examiner.

CERTIFIED COPY OF FILE WRAPPER AND CONTENTS IN THE MATTER OF THE LETTERS PATENT OF THE UNITED STATES, GRANTED EBENEZER WILSON, NO. 5472, DATED MARCH 14, 1848.

[PUT IN EVIDENCE, PAGE 363, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy from the files of this office of the file wrapper and contents in the matter of letters patent granted Ebenezer Wilson, dated March 14, 1848, No. 5472, for improvement in machinery for dressing combs.

In testimony whereof, I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this fifteenth day of March in the year of [SEAL] our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth.

ELLIS SPEAR,
Acting Commissioner.

No. 2073. 20 August, 1844.

In conformity to an Act of Congress entitled "An act to promote the progress of the useful arts," approved 4th of July, 1836, I have

received of Ebenezer Wilson, Redding, Conn., twenty dollars, which sum has been placed to the credit of my account in the Bank of Washington, D.C., under date of 5 August, 1844, and for which I have signed a receipt Caveat Combs.

W. SELDEN,
Treasurer of the United States.
R. T. SMITH,
Register of the Treasury.

Registered, — W.N.B.

To the Commissioner of Patents:

Enclosed are ten dollars, which, with twenty dollars for which Mr. Wilson holds a note, makes the full amount. Please forward a receipt and any communications to me.

HENRY DUTTON.

Bridgeport, Feb'y 10th 1842.

To the Commissioner of Patents:

The petition of Ebenezer Wilson, of Ridding in the County of Fairfield and State of Connecticut, respectfully represents, —

That your petitioner has invented a new and useful machine for cutting the teeth and quilling the backs of combs, which he verily believes has not been used or invented prior to the invention thereof by your petitioner. He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same upon the terms and conditions expressed in the Act of Congress in that case made and provided; he having paid thirty dollars into the treasury, twenty dollars having been paid on entering a caveat for said invention and ten dollars being herewith transmitted (the certificate on the caveat being dated 15 July, 1844), and complied with the other provisions of said act.

Dated at Redding, July 10th, 1845.

EBENEZER WILSON.

To all whom it may concern:

Be it known that I, Ebenezer Wilson, of Redding in Fairfield County, State of Connecticut, have invented a new and useful machine for cutting the teeth and quilling the backs of combs; and I do hereby declare that the following is a full and exact description: My invention consists of two revolving cylinders made of steel or other material suitable for cutting, one being used for cutting the teeth and the other for quilling the backs of combs. Both are constructed on the same principles. The former is turned with beads and flutes, in the direction of the circumference of the cylinder, ot suitable width and shape so that the flutes may fit the convex surface of the teeth which are to be cut. The other in like manner is to be turned with a moulding of shape to fit the moulding or quill on the back of the comb. The cylinders being turned as above described, are cut lengthwise into teeth or notches.

Fig. 1 of the drawing hereunto attached of an angle suitable for cutting in a revolving motion, and far enough apart to leave a space of turned surface, *s*, *s*, fig. 1, of sufficient width to allow the sharpening of the teeth repeatedly without varying the size of the cylinder or the shape of the cutting surface. Both the cylinders can be fitted to the same mandrel, so as to used alternately. Fig. 2 represents the cylinder for cutting the teeth with the beads and flutes. Fig. 5 represents the other cylinder with the moulding or quill. Fig. 3 represents the quilling cylinder and attached to the mandrel *a*, and set in a convenient frame *k*, *k*, fig. 3. When the piece is to be quilled it is put into a place formed for the purpose in the upper surface of a sliding block *h*, fig. 3. The block is then pushed under the cylinder, beneath a table or plate, *l*, which confines the piece in its place, and through which is a hole permitting the cylinder when in motion to act upon the piece to be quilled. The cylinder may be put in motion by any motive power. The piece is pushed through under the cylinder, and the quilling is thus completed. When teeth are to be cut, the piece is fastened by one of its edges, *v*. Fig. 4 is a vise or clamp, *o*, at the end of a sliding pin or mandrel, *n*, and held firmly in the vise or clamp by a screw or otherwise. This pin or mandrel is set so that it can be

turned and also moved backward and forward, in a sliding frame, *m*. When teeth are to be cut, the pin or mandrel is pushed forward, so that the piece to be cut may rest on a block, *t*, attached to the sliding frame. The sliding frame is then pushed forward so as to bring the piece to be cut under the revolving cylinder far enough to make the teeth of suitable length. The beads in the teeth of the cylinder immediately cut out the spaces between the teeth a little more than half way through, and the flutes cut one half of each of the teeth smooth and true. The frame is then drawn back, and the pin or mandrel is also drawn back, past the block *t*, and turned half round, when it is pushed forward again, so that the piece may rest on the block *t*. The sliding frame is again pushed forward, bringing the other side of the piece under the action of the cylinder, by which the residue of the spaces are cut out and the teeth completed. The sliding frame is formed with an inclined plane on its under surface, so that the ends of the teeth are raised higher against the cylinder and brought to a point.

What I claim as my invention, and desire to secure by letters patent, is, first, the mode of making the cylinders with broad teeth with flutes and beads, thereby cutting the teeth of the combs smooth and of any required form, and enabling the teeth of the cylinders to be repeatedly sharpened, without diminishing the size of the cylinders or altering the shape of the cutting surface.

Secondly, the arrangement and combination of the different parts as above specified, as adapted to the cutting of the teeth and quilling the backs of combs.

EBENEZER WILSON.

Witnesses,

HENRY DUTTON,

I. HENRY ADAMS.

COUNTY OF FAIRFIELD, } ss.
STATE OF CONNECTICUT, }

On this tenth day of July, 1845, before the subscriber, a justice of peace for said County of Fairfield, personally appeared the withinnamed Ebenezer Wilson, and made solemn oath that he verily be-

lieves himself to be the original and first inventor of the machine herein described for cutting the teeth and quilling the backs of combs, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

HENRY DUTTON,
Justice of Peace.

BRIDGEPORT, July 10, 1845.

To the Commissioner of Patents:

Sir, — I forwarded by to-day's mail the papers, &c., in an application for a patent, but enclosing them in a hurry, I find that I used the original draft of the specification, by mistake, instead of the one signed by Mr. Wilson. I therefore enclose the petition and specification which should have been attached to the affidavit, which you are requested to substitute for the other, or forward all the documents to me for that purpose if necessary.

Your Obt. Servt.,
HENRY DUTTON.

No. 619. 18 AUGUST, 1845.

In conformity to an Act of Congress, entitled "An act to promote the progress of the useful arts," approved 4th of July, 1836, I have received of Ebenezer Wilson, Redding, Ct., ten dollars, which sum has been placed to the credit of my account in the Exchange Bank, D.C., under date of 1st August, 1845, and for which I have signed a receipt, patent manufacture of combs.

W. SELDEN,
Treasurer of the United States.

Registered.
R. H. GILLET,
Register of the Treasury.

BRIDGEPORT, Nov. 1, 1845.

To the Commissioner of Patents:

Sir, — I have thought it best to make out new papers on Ebenezer Wilson's patent, as it was impossible to make all the necessary alter-

ations in the old ones. I trust, however, no alteration has been made in the *character* of the invention claimed. The specification is only more full and explicit and the drawings larger and more complete. You will probably find in the box containing the model, the *quilling cylinder* rolled up in a paper. I presume it escaped your notice, as Mr. Wilson is positive that he put it in. If you do not find it, please send word, and Mr. W. will forward another. Requesting an early examination, I remain,

Your Obt. Servt.,

HENRY DUTTON.

STATE OF CONNECTICUT, } ss.
COUNTY OF FAIRFIELD, }

On this first day of November, 1845, before the subscriber, a justice of peace for said County of Fairfield, personally appeared the within-named Ebenezer Wilson, and made solemn oath that he verily believes himself to be the original and first inventor of the machine herein described for cutting the teeth and quilling the backs of combs, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

HENRY DUTTON,

Justice of Peace.

PATENT OFFICE, Nov. 24, 1845.

Sir,—The claims of Ebenezer Wilson to letters patent for an alleged Impt. in machinery for dressing combs has been examined and found to present nothing essentially new. The mode of forming the teeth of the cutter, covered by the first claim, will be found in a great variety of cutting instruments and for the same purpose; to wit, for the purpose of sharpening without diminishing the diameter of the cutter. You will find the same principles in some of the circular saws in use, in borers, in screw cutters, and in letters patent granted to B. M. Martz, in June, 1836, for a planing, tonguing and grooving machines. The other alleged peculiarity of the cutters, to wit, *shaping* it so as to give the required dressing to the combs, is not the subject of letters patent. It does not differ essentially from

cutters for dressing sash, &c., and cutters for the same purpose will be found in letters patent granted Redheffer, in 1834. The third claim covers the ordinary mode of feeding, in planing and other machines, and is not patentable.

That part of the model to which you refer is not to be found in the office, but as the mere form of the cutting edge is not the subject of letters patent, the cutter you have presented being the same in principle, is sufficient. You can withdraw the application or appeal.

E.B.

To HENRY DUTTON, Esq.,
Bridgeport, Ct.

COUNTY OF FAIRFIELD, } ss.
STATE OF CONNECTICUT, }

On this twentieth day of March, 1847, before the subscriber, a justice of the peace for said county, personally appeared the within-named Ebenezer Wilson, and made solemn oath that he verily believes himself to be the original and first inventor of the herein-described improvement in machinery for the manufacture of combs, and that he does not know or believe that the same was ever before used or known, and that he is a citizen of the United States.

Sworn before me, JARED OLMSTEAD,
Justice of the Peace.

To the Commissioner of Patents:

The petition of Ebenezer Wilson, of Redding in the County of Fairfield and State of Connecticut, respectfully represents, —

That your petitioner has invented a new and useful improvement in machinery for the manufacture of combs, which he verily believes has not been used or known prior to the invention thereof by your petitioner, he therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and

conditions expressed in the Act of Congress in that case made and provided; he having paid thirty dollars into the treasury, and complied with other provisions of the said act. And he hereby authorizes C. M. Keller and J. J. Greenough to act as his attorneys in presenting this application, altering or withdrawing the same as the case may require, and to receive the patent when granted.

EBENEZER WILSON.

To all to whom these presents shall come:

Be it known that I, Ebenezer Wilson, of Redding in the County of Fairfield and State of Connecticut, have invented a new and useful improvement in machinery for cutting combs and quilling their backs, and that the following is a full, clear and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing and using the same, reference being had to the accompanying drawings making part of this specification, in which figure 1 is an isometrical view of the machine, and figure 2 represents details of the parts detached. The same letters indicate like parts in all the figures.

The nature of my improvement consists in the manner of holding and conveying the pieces of horn or other material to the cutters, and so constructing said cutters as to always preserve the same diameter and form of moulding during the process of sharpening until the cutters are entirely worn out.

The construction is as follows: on a suitable frame (*a*) a table (*b*) is supported with the standards of the frame projecting above it; just above the table (*b*) a shaft (*c*) is situated having its bearings in said standards; on this shaft there is a cutter head, to be hereafter more particularly described, and also a pulley for driving it. The cutter head projects through the table on the under side of which a groove (*d*) is cut, in a line with said cutter head, and into which it projects. A sliding carriage (*e*) is made to move back and forth under the cutter, its open side being guided by the groove (*d*) in which it slides. It is stayed on ways in the frame below to keep it in its place, and may be moved back and forth by hand, a handle

(*f*) being shown in the drawing intended for that purpose. In the upper surface of the carriage (*e*) there is a recess (*h*) formed, extending from side to side, into which the material (*i*) to be cut is placed, and by pushing forward the carriage, the article (*i*) is carried into the groove (*d*) on the under side of the table and is thus held firmly while the cutter is acting on it — and as soon as it is drawn out it is free and easily removed, and can be replaced by another. This is a matter of great importance in such rapid and cheap operations, while the greatest accuracy is also insured; for while it is under the action of the cutter it is steadily held on all sides, although in short pieces.

The cutter is formed of a short cylinder of steel on the face of which is turned any formed moulding or pattern suited to the purpose; in this cylinder at proper intervals notches are filed, forming cutters or teeth on the surface and which cutters can be filed up sharp till the cutter wears out the whole space between one notch and another; this will be so obvious on reference, that it needs no further description.

Having thus fully described my improvement, what I claim as new and desire to secure by letters patent is, the method of holding the material to the revolving cutter, without clamping, substantially as herein described, by inclosing said material on all sides, by the combination of the recesses formed in the carriage and table, through which the rotary cutter head projects, in the manner and for the purpose set forth.

EBENEZER WILSON.

FREDERICK OLMSTEAD,
JARED OLMSTEAD, } witnesses.

PATENT OFFICE, July 7, 1847.

Gentlemen, —

The claim of E. Wilson to letters patent for alleged Impts. in comb machinery has been examined and found to present nothing essentially new.

You are referred to letters patent granted to Barnabas Langdon for a machine for planing shingles, in Jany. 1838.

You can withdraw or appeal.

H.H.S.

Messrs. K. and Greenough,
Washington, D.C.

No. 5472.

Ebenezer Wilson.

1358.

Town of Redding,
County of Fairfield,
State of Connt.

Manufacture of Combs.

Rec'd	July 12, 1845.
Petition	" "
Affidavit	" "
Specification	" "
Drawing sketches (within)	
Model 3 "	" 31 "

Treasurer's certificate, $20, July 15, 1844.
$10, July 12, 1845.
Examined Fitzgerald, March 3d, 1848.
Issue, H. H. Sylvester, 7.
Patented March 14, 1848.
Recorded Vol. 33, page 461.
Henry Dutton,
Bridgeport, Ct.

K. and Greenough, *Agt's.*

May 8, 1846.

Specification and drawing returned, Oct. 7th, 1845.
Rejected, Nov. 24th, 1845.
Drawings and Specification to Agents, March 9, 1857.
Rejected July 7th, 1847.
Papers and drawing to Agent, July 10, 1847.
Ex.—J.A.W.

DEFENDANT'S EXHIBIT As. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 6211, DATED MARCH 20, 1849.

[PUT IN EVIDENCE, PAGE 363, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Joseph P. Woodbury, of Boston, Massachusetts, has alleged that he has invented a new and useful improvement in planing machines, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said mprovement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph P. Woodbury, his heirs, administrators or assigns, for the term of fourteen years from the twentieth day of September, one thousand eight hundred and forty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Joseph P. Woodbury in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twentieth day of March in the year of our Lord one thousand eight [L.S.] hundred and forty-nine, and of the independence of the United States of America the seventy-third.

T. EWING,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

EDMUND BURKE,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same

To all to whom these presents shall come:

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented certain new and useful improvements in planing and tonguing and grooving boards, &c., and that the following is a full, clear and exact description of the principle or character which distinguishes them from all other things before known, and of the usual manner of making, modifying and using the same, reference being had to the accompanying drawing which illustrates the same, in which fig. 1 is a side elevation, fig. 2 is a plan, fig. 3 is an end elevation, and figs. 4 and 5, 6 are sections of the planes and stocks. The same letters refer to like parts in all the figs.

My improvements are applicable to planing on one or both sides of the board, and also tonguing and grooving all in the same machine, by passing the board once through it, and may be used for planing plank, boards, clapboards and other similar materials.

To construct this machine a substantial frame, *a*, *a*, is formed of a suitable capacity to contain the machinery; near one end of this frame a carrying cylinder or wheel, *b*, is placed and a similar one, *c*, is located near the centre of the length of the frame; over these carrying cylinders an endless travelling platform, *d*, passes, which is formed of lays of metal, or other suitable material, the surface of

which should be fluted, linked together in an endless chain, similar to some of the well-known horse powers. The upper part of this platform runs on ways or rollers affixed to the frame for that purposes. and which sustain it perfectly level. This platform is moved by a train of pinions and wheels, *e*, *f*, *g*, *h*, *i*, which connect with the prime mover. Directly over the above-named platform there is another endless belt, *k*, of similar construction, but somewhat shorter; this is geared to the one below, so as to move at the same velocity; between these platforms the board is made to pass endways to the stationary cutters hereinafter described. The board being griped between these two revolving carriers, which cover a considerable extent of its surface, is driven under the stationary cutters and planed. The upper carrier being made to rise and fall for the purpose of admitting materials of different thicknesses, one or more pairs of geared rollers or platforms may be put beyond the cutters, for the purpose of conveying the plank or board out of the machine after it is planed.

The cutters for planing the upper side of the plank are eight, more or less, in number, varying according to the purpose for which they are wanted; they are situated over the inner end of the platform *d*, or that end which is next the centre of the frame; the frame *l* of the cutters is made adjustable, so as to be raised or lowered to suit the material to be planed, and to it the guides or ways *m*, under which carrier K passes, are attached; two connecting rods, *n*, one on each side, are connected by one end to the cutter frame, and by the other to the frame which sustains the upper carrier, the end that is attached to the cutter frame being carried down to it at an angle sufficient to create the proper friction to carry the board or plank forward against the resistance of the cutters. The cutters are single and double plane irons, *o* (see fig. 4), made similar to those of a common plane; they are attached to stocks, or cast-iron beds, *p*, that extend across the machine from one side to the other, and are joined to the side frame *l'*, where they can be each adjusted by set screws, *q*. Each of the beds are made at different angles with the plank, the first being quite acute and the last more obtuse, all of which is clearly illustrated in fig. 4. Between the cutters and directly in front of

the edge of each I insert pressure bars or rollers, *r*, which form a movable mouth to each cutter; they are so arranged as to be permitted to rise, and are held down by springs, *s*, or weights; they yield to any inequalities in the material to be planed, without clogging the springs, and set screws can be all below the top of the cutters, as shown full size in fig 6. This arrangement of a movable mouthpiece is very important in the practical operation of the machine; the cutter may be placed oblique or straight across the board, as found most desirable.

Beyond the planing stock, I place two or three rollers, *t*, between which and another set of planes, *u*, the plank passes to plane the other side if required; it then moves forward between side cutters for tonguing and grooving the edges. One of these series of edge cutters is made stationary, as shown at *v*, in the drawing; the other series, *w*, on the opposite side, are made movable, and may be set up toward the others with set screws, *x*, to hold the edges steady; there are two sets of short friction rollers that pinch the edges of the board between them; one of these sets, *y*, are stationary on their shafts, the others have a lateral motion corresponding with the cutters *w*, as will be seen in fig. 3. The cutters must be sufficient in number to complete the tongue or groove, and for this purpose eight will generally be required; I form spur cutters either on these cutters, or made separate like a carpenter's groove plane. The planes may stand in an oblique direction instead of at right angles to the line of motion, if found desirable, and the two last planes should be double ironed, and be set at about the same angle as a carpenter's finishing plane.

It will be obvious that mouldings of any description can be cut in this machine, that can be executed by a hand plane; and for clapboards the movable platform will require to be made inclined on its surface. A blower or brush roller may be used to clean off the grit from the surface of the board before it reaches the cutters, and also to roll up and clear away the shavings if necessary, and a circular saw may be used for edging the boards.

To sharpen the plane irons they can be removed, together with the stocks, and sharpened upon a grindstone or emory wheel, which will

give the proper level to the plane and will also curve out the stock, so as to make as little bearing as possible just behind the cutting edge.

The frame in which the stocks are set is adjusted according to the thickness of the stuff to be worked; each stock is set in the frame and adjusted to take off successive shavings till the material is, finished to the thickness required. In planing light material, rollers may be substituted for the top platform, but this I deem substantially a mechanical equivalent when combined and geared with the lower movable platform.

Having thus fully described my improved planing machine, I wish it to be understood that I do not claim merely the two revolving feeding platforms, they having before been used; but what I claim therein as new, and for which I desire to secure letters patent, is first, the combination of endless platforms or bands, as described, above and below the plank, and geared together so as to be forced to move in one direction and with the same velocity, said top platform being held down upon the board by means of the links (*n*), with a force varying with the resistance of the cutters, for the purpose of forcing the plank through under the stationary cutters, as above described, when used in combination with said stationary cutters.

Secondly, I claim the stationary cutters in combination with the yielding bar mouthpieces, substantially in the manner and for the purpose set forth.

Thirdly, I claim the adjustable edge rollers in combination with the tonguing and grooving cutters, or other stationary edging cutters, as above made known.

Witnesses: JOSEPH P. WOODBERRY.

J. J. GREENOUGH,

WM. GREENOUGH.

Ex'd.—I.R.

DEFENDANT'S EXHIBIT Ar.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED BENJAMIN REDHEFFER AND WILLIAM REDHEFFER, MAY 26, 1834.

[PUT IN EVIDENCE, PAGE 363, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Benjamin Redheffer and William Redheffer, citizens of the United States, have alleged that they have invented a new and useful improvement in comb making, which improvement they state has not been known or used before their application; have affirmed that they do verily believe that they are the true inventors or discoverers of the said improvement; have paid into the treasury of the United States the sum of thirty dollars, delivered a receipt for the same, and presented a petition to the Secretary of State, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are thefore to grant, according to law, to the said Benjamin Redheffer and William Redheffer, their heirs, administrators or assigns, for the term of fourteen years from the twenty-sixth day of May, one thousand eight hundred and thirty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Benjamin Redheffer and William Redheffer themselves in the schedule hereto annexed, and is made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the United States to be hereunto affixed.

Given under my hand, at the city of Washington, this twenty-sixth day of May in the year of our Lord one thousand [SEAL] eight hundred and thirty-four, and of the independence of the United States of America the fifty-eighth.

By the President, ANDREW JACKSON.

LOUIS MCLANE,
Secretary of State.

CITY OF WASHINGTON, TO WIT:

I do hereby certify that the foregoing letters patent were delivered to me on the twenty-sixth day of May in the year of our Lord one thousand eight hundred and thirty-four, to be examined; that I have examined the same, and find them conformable to law; and I do hereby return the same to the Secretary of State, within fifteen days from the date aforesaid, to wit, on this twenty-sixth day of May in the year aforesaid.

B. F. BUTLER,
Attorney General of the United States.

MAY 26, 1834.

BENJAMIN REDHEFFER AND WILLIAM REDHEFFER, PENN TOWNSHIP, PENNSYLVANIA.

LETTERS PATENT.

The Schedule referred to in these Letters Patent and making part of the same, containing a description in the words of the said Benjamin Redheffer and William Redheffer, themselves, of their improvement in comb making.

To all to whom these Presents shall come:

Be it known that we, Benjamin and William Redheffer, of Penn Township in the County of Philadelphia and State of Pennsylvania, have invented a new and useful improvement in comb making, styled a getting-out and quilling machine, and that the following is a full and

exact description of the construction and operation of the said machine as invented by us : —

This said machine consists of revolving scrapers or cutters of different sizes ; these scrapers can be made of cast steel or wrought from the solid by cutting teeth in them, or they can be made with knives or scrapers set round an axle or cylinder with the concavities in them so as to produce the quills or raisings on the pieces. The plane scraper will do for all sizes if it is made about twelve inches long. The quilling scrapers, there must be one to every size, that is, in width, for example, a piece that is to have inch and a half teeth cut in it, and the quills $\frac{1}{4}$ of an inch each, therefore the quilling scraper must be two inches wide, and the space between the quills must be one inch and a half, and so on to any size.

The quilling scraper may be used in a duplicate ratio on the same axle if the travelling table is neatly adjusted on the same axle. See the drawing, plate first, C, D, the plane into which the uprights are left, B, B, with their sliding boxes, E, E. The rods A, A are fastened to them with threads cut on the ends of them to admit the small nuts *a*, *a*, so that the boxes E, E, which holds the axle of the revolving scraper I, which can be raised or lowered by the screws A, A, the saws K, K, is fastened to the ends of the scraper I, to regulate the width. P, the pulley fastened to the axle of the revolving scraper I, with the small nut V ; S, the travelling table or sliding plane working in the grooves *t*, *t*. H, H, the uprights to support the axle L. O, O, the arms to support the roller R, the arm N is fastened to the spring F, with the chain *m*, which presses the roller R on the moving plane S, which is pushed forward and passes under the roller R, which keeps the piece level and prevents it from jarring. Plate 2d, fig. 12, the moving plane, fig 11, the upright, fig. 10 the roller and its frame, fig. 9. The pulley, fig. 8. O the nuts, fig. 7 the axle cylinder, fig. 5. The plain revolving scraper, fig. 4. The quilling or concave scraper, fig. 3. The axle, fig. 2. The saws fig. 1, 1, will show the shape of the knives or scrapers which can be set round an axle or cylinder, any number of them may be used to form one like fig. 4 ; the plain scraper can be made the same. I omitted to state in the above that the quilling and plain revolving scraper

is so constructed as to slide on and off the axle, so that the same axle may do for any size quiller, see the analytical drawing plate 2d, figs. 3, 4, 5, 7; there may be two or more of the quilling scrapers used on the axle at once if the workmen can attend to them.

The diameters of the revolving cutters or scrapers may be from two to three inches.

WILLIAM REDHEFFER.
BENJAMIN REDHEFFER.

Witnesses,
JOHN R. WALKER,
ANDW. M. GRANNEL.

(Patented 26 May, 1834.) Drawing made.
Ex.—J.A.W.

DEFENDANT'S EXHIBIT Ap.—D.B.H., Special Examiner.

CERTIFIED COPY OF RE-ISSUED LETTERS PATENT OF THE UNITED STATES, GRANTED TO WILLIAM W. WOODWORTH, IN TRUST, FOR THE HEIRS AT LAW OF WILLIAM WOODWORTH, NO. 71, DATED JULY 8, 1845.

[PUT IN EVIDENCE, PAGE 363, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas William W. Woodworth, Admr. of William Woodworth, deed., Hyde Park, N.Y., has alleged that said Wm. Woodworth invented a new and useful improvement in machines for planing tonguing and grooving and dressing boards, &c., for which letters patent were granted, dated the 27th day of December, 1828, which letters patent have been extended (as will appear by the certificates

appended thereto, copies of which are hereunto attached) for fourteen years from the expiration of said letters patent, and which letters patent are hereby cancelled on account of a defective specification, which he states has not been known or used before said Wm. Woodworth's application; has made oath that he is and that said Wm. Woodworth was a citizen of the United States; that he does verily believe that said Wm. Woodworth was the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of fifteen dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said William W. Woodworth, in trust, for the heirs at law of said W. Woodworth, their heirs, administrators or assigns, for the term of twenty-eight years from the twenty-seventh day of December, one thousand eight hundred and twenty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said William W. Woodworth in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this eighth day of July in the year of our Lord one thousand eight [SEAL] hundred and forty-five, and of the independence of the United States of America the seventieth.

JAMES BUCHANAN,
Secretary of State.

Countersigned, and sealed with the seal of the Patent Office.

HENRY H. SYLVESTER,
Acting Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that the following is a full, clear and exact description of the method of planing, tonguing and grooving plank or boards, invented by William Woodworth, deceased, and for which letters patent of the United States were granted to him on the 27th day of December in the year one thousand eight hundred and twenty-eight, the said letters patent having been surrendered for the purpose of describing the same invention, and pointing out in what it consists in more full, clear and exact terms than was done in the original specification. The plank or boards which are to be planed, tongued and grooved are first to be reduced to a width by means of circular saws, by reducing wheels or by any other means. When circular saws are used for this purpose, two such saws should be placed upon the same shaft on which they are to be capable of adjustment, so that they may be made to stand at any required distance apart; under these the board or plank is to be forced forward and brought to the width required; this apparatus and process do not require to be further explained, they being well understood by mechanicians. When what has been above denominated reducing wheels are used, these are to consist of revolving cutter wheels which resemble in their construction and action the planing and reducing wheel to be presently described; these are to be made adjustable like the circular saws, but the latter are preferred for this purpose. The plank may be reduced to the width on a separate machine.

When the plank or boards have been thus prepared (on a separate machine), they may be placed on or against a suitable carriage, resting on a frame or platform, so as to be acted upon by a rotary cutting or planing and reducing wheel, which wheel may be made to revolve either horizontally or vertically as may be preferred. The carriage which sustains the plank or board to be operated upon may be moved forwards by means of a rack and pinion, by an endless chain or band, by geared friction rollers, or by any of the devices well known to machinists for advancing a carriage or material to be acted upon in machines for various purposes. The plank or board is

to be moved on towards the cutting edges of the cutters or knives on the planing cylinder, so that its knives or cutters as they revolve may meet and cut the plank or board in a direction contrary to that in which it is made to advance. The edges of the cutters are in this method prevented from coming, first, into contact with its surface, and are made to cut upwards from the reduced part of the plank towards said surface, by which means their edges are protected from injury by gritty matter, and the board or plank is more evenly and better planed than when moved in the reverse direction.

After the board or plank passes the planing cylinder, and as soon or fast as the planing cylinder has done its work on any part of the board or plank, the edges are brought into contact with two revolving cutter wheels, one of which is adapted to the cutting of the groove, and the other to the cutting of the two rebates that form the tongue.

When the axis of the planing and reducing wheel stands vertically, the grooving and tonguing wheels are placed one above the other with the plank edgewise between them. When the axis of the planing wheel stands horizontally, these wheels are on the same horizontal plane with each other, standing on perpendicular spindles.

The grooving wheel consists of a circular plate fixed on an axis, and having one, two, three, four or more cutters which are to be screwed, bolted or otherwise attached to it, the edges of which cutters project beyond the periphery of the plate to such distance as is required for the depth of the groove. Their thickness may be such as is necessary for its width; they are, of course, so situated as to cut the groove in the middle of the edge of the board or as nearly so as may be required. The tonguing wheel is similar in form to the grooving wheel, but it has cutters on each of its sides, or otherwise so formed and arranged as to cut the two rebates which are necessary to the formation of the tongue. The grooving and tonguing cutters at the same time, and by the same operation, reduce the board or plank to an exact width throughout. When the axis of the planing wheel is placed vertically, the knives or cutters may be made to plane two planks at the same time, the planks being in this case moved in contrary directions and so as to meet the edges of the re-

volving knives or cutters. When the machine is thus constructed, a second pair of grooving and tonguing wheels may be made to operate in the same way with those above described.

A machine to operate upon a single plank or board, and having the axis of the planing wheel placed horizontally, will however be more simple and less expensive than that intended to operate on two planks simultaneously.

In the accompanying drawing, fig 1 is a perspective representation of the principal operating parts of the machine, when arranged and combined for planing, tonguing and grooving, and when so arranged as to be capable of planing two planks at the same time, the axis of the planing wheel being placed vertically. A, A is a stout, substantial frame of the machine which may be of wood or of iron, and may be varied in length, size and strength, according to the work to be done. B, B are the heads of the planing cylinder, and *c*, *c*, the knives or cutters which extend from one to the other of said heads, to the peripheries of which they may be attached by means of screws. The knives *c*, *c*, with the faces forming a planing angle, may be placed in a line with the axis J of the cylinder, or they may stand obliquely thereto as may be preferred, but in the latter case, the edge should form the segments or portion of a helix; *b* represents a pulley near to the upper end of the axis J and I, a pulley or drum which may be made to revolve by horse, steam or other motive power, and from which a belt may extend around the pulley *b*, to drive the planing cylinder and other parts of the machinery. G is the carriage, which is represented as being driven forward by means of a rack and pinion, H; against this carriage the plank K, which is to be planed tongued and grooved, is placed, and is made to advance with it. It will be manifest however that the plank may be moved forward by other means, as for example by an endless chain or band passing around drums or chain wheels, or by means of geared friction wheels borne up against it; to cause the carriage and plank to move forward readily, there may be friction rollers, *f*, *f*, *f*, placed horizontally and extending under them the rollers *f'*, *f'*, *f'*, which stand vertically, are to be made to press against the plank, and keep it close to the carriage, and thus prevent the action of the cutters from drawing the

plank up from its bed in cutting from the planed surface upwards, they may be borne against it by means of weights or springs, in a manner well known to machinists. In a single horizontal machine, the horizontal friction rollers may be geared, and the pressure rollers placed above them, to feed the board with or without the carriages, a bed plate being used directly under the planing cylinder. Fig. 2 is a separate view of the planing cylinder with its knives or cutters, and fig. 3 an end view of one of the heads; E, E′ are the revolving cutter or tonguing and grooving wheels, and D, D, wheels upon their shafts which may be driven by bands or otherwise, so as to cause said wheels to revolve in the proper direction.

Fig. 4 is a side view of one of these wheels; fig. 5 is an edge view of the tonguing wheel, and fig. 6 an edge view of the grooving wheel, the two latter being each shown with two cutters in place.

The number of cutters on these wheels may be varied, but they are represented as furnished with four. The cutters may be fixed on the sides of circular plates, with their edges projecting beyond the periphery of said plate.

The edges of the plank, as its planed part passes the planing cylinder, are brought into contact with the above-described tonguing and grooving wheels, which are so placed upon their shafts as that the tongue and groove shall be left at the proper distance from the face of the plank, the latter being sustained against the planing cylinder, by means of the carriage or bed plate or otherwise, so that it cannot deviate, but must be reduced to a proper thickness and correctly tongued and grooved.

In fig. 1, above referred to, only one carriage and one pair of cutter wheels are shown, it not being deemed necessary to represent those on the opposite side, they being similar in all respects.

Fig. 7 represents the same machine with the axis of the planing cylinder placed horizontally, and intended to operate on one plank only at the same time. A, A is the frame; B, B the heads of planing cylinder; *c*, *c* the knives or cutters attached to said heads, to meet the different thicknesses of the plank or board. The bearings of the shaft of the cylinder may be made movable by screws or other

means, to adjust it to the work; or the carriage or bed plate may be made so as to raise the board or plank up to the planing cylinder; E and E′ are the revolving cutters or tonguing and grooving wheels, which are placed upon vertical shafts, having upon them pulleys, D, D, around which pass belts or bands from the main drum I, to which a revolving motion may be given by any adequate motive power. From the drum I a belt, L, passes also around the pulley *b*, on the shaft of the planing cylinder, and gives to it the requisite motion. There may in this machine be a horizontal carriage, moved forward by a rack and pinion in a manner analagous to that represented in fig. 1, but in the present instance the plank is supposed to be advanced by means of one or two pairs of friction or feed rollers shown at *f*, *f*′. The uppermost *f*, *f*′ of the pairs of rollers may be held down by springs or weighted levers, which it has not been thought necessary to show in this drawing, as such are in common use. The lowermost of these rollers may be fluted or made rough on their surfaces, so as to cause friction on the underside of the plank. M, M′ are pulleys on the axles of these lower rollers which are embraced by bands, N, N′, which also pass around the pulley O, on a shaft which crosses the frame A, A, and has a pulley T on it, which is embraced by the belt P on a pulley, Q, on the shaft of the main drum I. These bands and pulleys serve to give motion to the feed rollers, as will be readily understood by inspecting the drawing. R, R are guide strips used in place of rollers, used for the same purpose, and also for bearing or friction rollers when the machine is vertical, to direct one edge of the plank; and against its opposite edge, any pressure may be used equal to the weight of the board or plank when worked in a vertical position. One of the cutter wheels should be made adjustable, to adapt it to stuff of different widths.

The planing cylinder and likewise the cutter or tonguing and grooving wheels may be constructed in the manner represented in figs. 2, 3, 4, 5 and 6, and hereinbefore fully described. One of the heads of the planing wheel may be made movable, to accommodate its length to the width of the board or plank to be planed.

The respective parts of this machine may be varied in size, as may also the velocity of the motion of the planing cylinder and cutter

wheels; but the following has been found to answer well in practice. The planing cylinder having four knives or cutters, may be twelve inches in diameter and may make two thousand, and upwards, revolutions in a minute. In a machine like that shown in fig. 7, the main drum I may be two feet in diameter, and may be driven with a speed of five hundred, and upwards, revolutions in a minute. The pulleys on the planing cylinder and on the cutter wheels may be six inches in diameter. The plank should be moved forward at the rate of about one foot for every hundred revolutions of the cutter wheel; and of course the diameters of the feed rollers and of the pulleys by which they are turned must be so graduated as to produce this result. The size and speed of the above parts of this machine may be in some degree varied, but the above have been found to work well.

Having thus fully described the parts and combinations of parts, and operation of the machine for planing, tonguing and grooving boards or plank, and shown various modes in which the same may be constructed and made to operate without changing the principle or mode of operation of the machine:

What is claimed therein as the invention of William Woodworth, deceased, is the employment of rotating planes, substantially such as herein described, in combination with rollers or any analagous device to prevent the boards from being drawn up by the planes when cutting upwards, or from the reduced or planed to the unplaned surface, as described;

And also the combination of the rotating planes with the cutter wheels for tonguing and grooving, for the purpose of planing, tonguing and grooving boards, &c., at one operation, as described;

And also the combination of the tonguing and grooving cutter wheels for tonguing and grooving boards, &c., at one operation, as described;

And finally, the combination of either the tonguing or the grooving cutter wheel for tonguing or grooving boards, &c., with the pressure rollers, as described; the effect of the pressure rollers in these operations being such as to keep the boards, &c., steady, and prevent the cutters from drawing the boards towards the centre of the cutter wheels, whilst it is moved through by machinery. In the

planing operation, the tendency of the plane is to lift the boards directly up against the rollers; but in the tonguing and grooving the tendency is to overcome the friction occasioned by the pressure of the rollers.

WILLIAM W. WOODWORTH,
Administrator of
WILLIAM WOODWORTH, *deceased.*

Witnesses,
JAMES MILHOLLAND,
CHS. M. KELLER.
Ex'd.—M.McB.

DEFENDANT'S EXHIBIT Ao.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED WILLIAM WOODWORTH DECEMBER 27, 1828.

[PUT IN EVIDENCE, PAGE 363, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas William Woodworth, a citizen of the United States, hath alleged that he has invented a new and useful improvement in the method of planing, tonguing, grooving and cutting into mouldings or either plank, boards or any other material, and for reducing the same to an equal width and thickness, and also for facing and dressing brick and cutting mouldings on or facing metallic, mineral or other substances, which improvement he states has not been known or used before his application; hath made oath that he does verily believe that he is the true inventor or discoverer of the said improvement; hath paid into the treasury of the United States the sum of thirty dollars, delivered a receipt for the same, and presented

a petition to the Secretary of State, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose: these are therefore to grant, according to law, to the said Wm. Woodworth, his heirs, administrators or assigns, for the term of fourteen years from the twenty-seventh day of December, one thousand eight hundred and twenty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Wm. Woodworth himself in the schedule hereto annexed, and is made a part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the United States to be hereunto affixed.

Given under my hand, at the city of Washington, this twenty-seventh day of December in the year of our Lord one
[SEAL] thousand eight hundred and twenty-eight, and of the independence of the United States of America the fifty-third.

By the President,

J. Q. ADAMS.

H. CLAY,
Secretary of State.

CITY OF WASHINGTON, TO WIT:

I do hereby certify that the foregoing letters patent were delivered to me on the twenty-seventh day of December in the year of our Lord one thousand eight hundred and twenty-eight, to be examined; that I have examined the same, and find them conformable to law; and I do hereby return the same to the Secretary of State within fifteen days from the date aforesaid, to wit, on this twenty-seventh day of December in the year aforesaid.

WM. WIRT,
Attorney General of the United States.

The schedule referred to in these letters patent, and making part of the same, containing a description in the words of the said William Woodworth himself of his improvement in the method of planing, tonguing, grooving and cutting into mouldings or either plank, boards or any other material, and for reducing the same to an equal width and thickness; and also for facing and dressing brick and cutting mouldings on or facing metallic, mineral or other substances.

The plank, boards or other material being reduced to a width by circular saws or friction wheels, as the case may be, is then placed on a carriage, resting on a platform, with a rotary cutting wheel in the centre, either horizontal or vertical. The heads or circular plates fixed to an axis may have one of the heads movable, to accommodate any length of knife required, the knife fitted to the heads with screws or bolts, or the knives or cutters for moulding fitted by screws or bolts to logs, connecting the heads of the cylinder, and forming, with the edges of the knives or cutters, a cylinder. The knives may be placed in a line with the axis of the cylinder, or diagonally. The plank or other material, resting on the carriage, may be set so as to reduce it to any thickness required; and the carriage, moving by a rack and pinion or rollers, or any lateral motion, to the edge of the knives or cutters, on the periphery of the cylinder or wheel, reduces it to any given thickness. After passing the planing and reducing wheel, it then approaches, if required, two revolving cutter wheels, one for cutting the groove, and the other for cutting the rabbets that form the tongue; one wheel is placed directly over the other, and the lateral motion, moving the plank or other material between the grooving and rabbeting wheels, so that one edge has a groove cut the whole length, and the other edge a rabbet cut on each side, leaving a tongue to match the groove. The grooving wheel is a circular plate, fixed on an axis, with a number of cutters attached to it, to project beyond the periphery of the plate, so that when put in motion will perform a deep cut or groove, parallel with the face of the plank or other material. The rabetting wheel, also of similar form, having a number of cutters on each side of the plate, projecting like those on the grooving wheel, cuts

the rabbet on each side of the edge of the plank, and leaves the tongue or match for the groove.

By placing the planing-wheel axis and cutter knives vertical, the same wheel will plane two planks or other material in the same time of one, by moving the plank or other material opposite ways, and parallel with each other, against the periphery of the planing or moulding wheel. The groove and tongue may be cut in the plank or other material at the same time, by adding a grooving and rabbeting wheel.

Said William Woodworth does not claim the invention of circular saws or cutter wheels, knowing they have long been in use; but he claims, as his invention, the improvement and application of cutter or planing wheels to planing boards, plank, timber or other material; also his improved method of cutters for grooving and tonguing and cutting mouldings on wood, stone, iron, metal or other material; and also for facing and dressing brick; as all the wheels may be used single and separately, for moulding or any other purpose before indicated. He also claims, as his improved method, the application of circular saws for reducing floor plank and other materials to a width.

Dated, Troy, December 4, 1828.

WILLIAM WOODWORTH.

Witnesses,

HENRY EVERTS,

D. S. GLEASON.

Ex'd. — M.McB.

DEFENDANT'S EXHIBIT Ak.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JAMES H. HUTCHINSON, NO. 1244, DATED JULY 16, 1839.

[PUT IN EVIDENCE, PAGE 364.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Freeman Walcott and James H. Hutchinson, of Boston, Massachusetts, have alleged that they have invented a new and useful improvement in the machine for planing lumber (the said Walcott having assigned all his right, title and interest in the said invention to James H. Hutchinson, of Boston, Mass.), which they state has not been known or used before their application; have made oath that they are citizens of the United States; that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said James H. Hutchinson, his heirs, administrators or assigns, for the term of fourteen years from the sixteenth day of July, one thousand eight hundred and thirty-nine, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Walcott and Hutchinson in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this sixteenth day of July in the year of our Lord one thousand eight [L.S.] hundred and thirty-nine, and of the independence of the United States of America the sixty-fourth.

JOHN FORSYTH,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

HENRY L. ELLSWORTH,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Freeman Walcott, of East Cambridge in the County of Middlesex and State of Massachusetts, and James H. Hutchinson, of the city of Boston in the County of Suffolk and state aforesaid, have invented a new and useful improvement on the machine for planing boards, plank, joists and other stuffs, and we do hereby declare that the following is a full, clear and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which figure 1 represents an elevation of one side of the machine; figure 2, a top view; figure 3, an elevation of the other side of the machine; figure 4, a transverse section on the line A, B, as denoted in fig. 1; figure 5, a front view of the "double iron rotary plane" in combination with the "throat or mouthpiece;" fig. 6, a top view of the same; fig. 9, a transverse section of the same; figures 7 and 8 represent the plan and elevation of the cutters; figure 10, an elevation of the cutter frame; figure 11, an elevation of the throat or mouthpiece; figure 12, an end view of the same; fig. 13, an end view of the cutter frame.

a, *a*, *a*, *a*, figs. 1, 2, 3 and 4, is the framework of the machine,

into which the various parts of the machinery are placed. *b'*, fig. 2, is the driving shaft upon which, at one end, the pulley *b* is fixed, to which the power is applied to set the feeding gear in motion. The small pinion *c*, figs. 1, 2 and 3, is fixed at the other end of the shaft *b'*, and engages with the large cog wheel *d*. The cog wheel *d* is fixed upon one end of the shaft *e*, seen in figs. 1, 2 and 3. Upon the other end of the shaft *e* is fixed a flange pinion, *g*, figs. 3 and 4, which engages immediately above it a similar pinion, *h*. The flange pinion *h* is fixed at one end of the shaft *i*, figs. 1, 2 and 3. The shafts *e* and *i* support two iron feed rollers *f* and *k*. The shaft *i*, upon which the flange pinion *h* and the feed roller *k* are fixed revolves in boxes, *i'*, placed in the levers *l*, *l*, as shown in fig. 3. The levers *l*, *l* are hung at one end in the upright supports *m*, *m*, figs. 1, 2 and 3; at the other end of the levers *l*, *l*, weights are placed, *n*, *n*, figs. 1 and 3. The board to be planed is placed between the feed rollers *f* and *k*, and by the motion of the machinery above described, made to move towards the planing gear. The weights hung at the end of the levers *l*, *l* are for the purpose of confining the upper feed rollers *k* to the board as it passes through the machine, and to secure the engagement of the flange pinions *g* and *h*, as above described.

We now proceed to describe the construction and operation of the planing gear. *r*, figs. 1, 2, 3, 4, 5 and 9, is the driving shaft of the planing gear; motion is given to it by the pulley O, fixed at one end of it, and acted upon by the belt *p*, figs. 1, 2, 3 and 4. The shaft *r* supports and carries the double iron rotary plane, and the throat or mouthpiece, seen in figs. 5, 6 and 9, fig. 4 also represents this arrangement.

The double iron rotary plane, a section of which is shown in fig. 9, consists of a cutter frame, *t*, *t* (and of which fig. 10 is an elevation), and two cutters, *u*, *u*, figs. 5, 6, 7, 8 and 9. The cutter frame, figs. 10 and 13, is of cast iron, and the outer parts O', O' we denominate the cap irons. The cap irons are of a necessary length, and the inner part is chamfered off, as seen in the figs. 9 and 13. There are four, or any necessary number, of short supports, *d' d'*, figs. 10 and 13, through which the shaft *r* passes when the cutter frame is fixed in the machine. The two outer supports are cast thicker than

the others, and the ends of the cap irons project beyond them. The cutter frame is cast in one piece excepting one of the outer supports, d', which is cast separate, for reasons hereinafter given.

The cutters u, v, figs. 6 and 7, are formed of plates of iron, the cutting edge tempered with steel; slots are cut in the back part of the cutters through which the screws r', r', that confine them to the cap irons, pass. These slots also admit of the cutters being moved forward or backwards upon the cap iron, thus obtaining a fine or coarse cutting edge, as may be required. This arrangement of the cutters and cap irons (the inner parts of which are chamfered as above described), forms what carpenters call a "double iron."

The throat or mouthpiece, of which fig. 11 is an elevation, fig. 12, an end view (a section is seen in fig. 9 and denoted by w in the other figures), is of cast iron with two ends (of the form shown in fig. 12), through which the shaft r passes. The two outer parts x, x are of the same length as the cap irons and cutters. Their shape is shown in fig. 9, in which is represented a transverse section of the mouthpiece, as above described. The outer parts are circular and the inner are hollowed, so as to form proper edges, which, when the mouthpiece is fitted to the plane, are brought near the edges of the cutters. When placed in the machine, in connection with the double iron rotary plane, the ends of the throat or mouthpiece lie without the two outer supports d', d' of the cutter frame, as shown in figs. 4, 5 and 6. This arrangement of the throat or mouthpiece to the cutter frame is effected by placing one end of the throat or mouthpiece over or outside one end of the cutter frame, while the other end of the throat or mouthpiece passes between the cap irons at the other end of the cutter frame (the support d' being left out at that end to admit of this, as before mentioned). The ends of the cap irons and the ends of the throat or mouthpiece being of the same length, are then made to coincide, and also the holes through the several supports of the cutter frame and those of the ends of the throat or mouthpiece; the separate support of the cutter frame is then placed in its proper place between the cap irons, and secured by screws. The cutter frame and throat or mouthpiece are then placed upon the shaft r. The cutter frame is secured to the shaft r by set

screws, q, passing through the supports d', d'. The cutters u, u are then placed upon the cap irons O', O', and when the cutting edge is regulated are screwed down. The edges of the throat or mouthpiece are then set to a proper distance from the edges of the cutters, and secured by set screws passing through the ends of the throat or mouthpiece, as shown in figs. 9 and 12, O''.

The shaft r revolves in movable boxes, a', fig. 3, and they are raised or lowered, as occasion requires, by the screws p', p'. By raising or lowering the boxes a', the thickness to which the board or stuff is to be finished or planed is regulated, as by these means the edges of the cutters are made to cut to any required depth in the stuff as it passes under them.

The object of the throat or mouthpiece, in combination with the double iron rotary plane, is to facilitate the throwing off of the shavings as they are cut from the stuff, and also to regulate the *finish* of the stuff, whether a coarse or fine finish.

The cutters, as they are placed forward or back upon the cap irons, present a coarse or fine cutting edge, as before mentioned, while the edges of the throat or mouthpiece are placed nearer to or farther from the cutting edges. For a fine finish the edges of the mouthpiece and the cutting edges are placed very near together, and for a coarse finish, placed farther apart; in either position they are secured by the set screws O'', as before described.

In order to confine the stuff steadily upon the bedpiece H, and under the double iron rotary plane, there are two small rollers, f', k', figs. 1, 2 and 4, placed one on each side of the planing gear. The board or stuff passes under these rollers. The rollers f', k' revolve in boxes at the ends of the rods h', h', and are kept down upon the board or stuff by means of the weights s, s, placed upon the levers e', e'. The rods h', h' are connected with the levers e', e', as shown in fig. 1.

The board or stuff to be planed is placed between the feed rollers f, k, and by their motion made to pass forward under the small roller f' to the planing gear. As it passes under the planing gear, which is in motion, the two cutting edges of the double iron rotary plane are presented to its surface in rapid succession, planing or cut-

ting down the board to the thickness required. The thickness to which the board or stuff is to be planed or finished, may be regulated, when the machine is in motion, by raising or depressing the boxes a', in which the shaft r revolves, as before described.

The double iron rotary plane may be made to revolve with any degree of rapidity required; the ordinary speed is about 3500 revolutions per minute. The speed of the feeding gear is about 18 revolutions per minute for this rate of the planing gear. The speed of both planing and feeding gear is regulated by any of the usual modes.

What we claim as our invention and desire to secure by letters patent, is the combination of the double iron rotary plane with the throat or mouthpiece, figs. 11 and 12, constructed and operating as herein described.

FREEMAN WALCOTT,
JAMES H. HUTCHINSON.

Witnesses,
CALVIN BROWN,
JOSEPH C. HOWARD.

Ex. — J.A.M.

DEFENDANT'S EXHIBIT Aj. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED BENJAMIN BROWN, NO. 4225, DATED OCTOBER 9, 1845.

[PUT IN EVIDENCE, PAGE 364, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Benjamin Brown, Burlington, Vermont, has alleged that he has invented a new and useful improvement in planing machines,

which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Benjamin Brown, his heirs, administrators or assigns, for the term of fourteen years from the ninth day of October, one thousand eight hundred and forty-five, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Benjamin Brown in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this ninth day of October in the year of our Lord one thousand eight hundred and forty-five, and of the independence of the United States of America the seventieth.

[SEAL]

N. B. TRIST,
Acting Secretary of State.

Countersigned and sealed with the seal of the Patent Office.

EDMUND BURKE,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these Presents shall come:

Be it know that I, Benjamin Brown, of Burlington in the County of Chittenden and State of Vermont, have invented a new and use-

ful improvement in planing machines for planing lumber; and I do hereby declare that the following is a full, clear and exact description thereof, reference being had to the accompanying drawings which form a part thereof, in which fig. 1 is a perspective view; fig. 2 is a side elevation; fig. 3 is a longitudinal vertical section; fig. 4 is a cross-section; fig. 5 a section of the carriage.

The nature of my invention consists in the endless carriage, and in combination therewith the adjustable rollers and gate in which the cutters are affixed.

The construction is as follows: a suitable frame, *a*, *a*, is made of cast iron or other material. At the sides and posts which are connected together by a sufficient number of wooden braces, *b*, *b*, on the inside of each of the side pieces, are guiding ways, *c*, for a purpose hereafter described. A series of castings or metal plates, *d*, are made, as shown detached in fig. 5, which forms a section of the carriage on which the board or other article to be planed rests. Through the centre of this plate from end to end are apertures made so as to leave an open rack, *e*, into which cog wheels play, as will presently appear. Each of the plates has two strips of wood affixed to its upper side, one on each side of the rack, and covering the rest of the surface of the plate.

The plates move along horizontally, guided by the ways *c* under the revolving cutter, at which point they are sustained by ribs, *x*, supported in and attached to the frame; they slide over these and form a solid bed for the stuff to be planed on. At each end of the machine the guide ways descend and form a groove which allows the outer end of the plate to descend about half-way down to the position they assume on returning, at which time the inner end of the plate arrives at the cog wheel (*f*), situated the distance of the length of a section plate from the end of the machine, and in the guide ways there is a semi-circular branch concentric with said cog wheel. This arrangement permits the section to fall, and be carried under the cog wheel, it being kept in gear by said guides. At the opposite end a similar arrangement is made for the purpose of raising the sections by means of another wheel (*g*). A third feeding cog wheel

g' is placed at the centre, by which the segments are moved, and this is connected with the moving power in any convenient way so as to adjust the feed. There is a bar (h) affixed to the frame at each end, that extends the whole length thereof, directly over the racks above named in the sections, and of the same width as the space between the strips of wood that cover the plate into which it fits and forms a level even surface under the plane, to support the article to be planed. Above the centre of the bed there is a gallows frame (i) bolted to the frame, which stands in an inclined position, within which, or on the upper side of which, a frame or gate (i') slides, in which the cutter is hung. This cutter is of ordinary construction, having three knives in it, but with double instead of single irons in it, as are generally used; a guiding roller (k) is attached to the gate by strong springs on a level with the lower line of the circumference of the cutter, and in front thereof. Behind the cutter, where the stuff to be planed is entered, there is another roller (i) that is kept down upon it with weights (w), and between which and the bed or carriage the stuff is held. A shield plate (m) is put behind the cutter to prevent clogging with chips.

The gate with the cutter can be graduated to any height while the machine is in operation, by means of a screw (n) that is attached to the centres of the gallows, and turns in a nut in the gate which moves it up and down.

It is obvious that there can be two cog wheels instead of three below g, one on each side, which will save the necessity of an opening in the centre.

Having thus fully described my invention, I wish it to be understood that I do not claim an endless platform formed of sections, nor do I claim the manner of moving them, they having been before used for a horse power. But what I do claim as my improvement, and desire to secure by letters patent, is the endless sectional platform or carriage such as herein described, which forms the bed for planing on, in combination with the rotating planing cutters, in the manner and for the purpose set forth, whether the central bar be used or not; and I also claim the sectional platform or carriage in com-

bination with the central bar, for the purpose and in the manner described.

BENJAMIN BROWN.

Witnesses,
W. EMERSON,
CHAS. INGALLS.
Ex.—J.A.W.

DEFENDANT'S EXHIBIT Ai.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED ALFRED T. SERRELL, NO. 5575, DATED MAY 16, 1848.

[PUT IN EVIDENCE, PAGE 364, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Alfred T. Serrell, New York, has alleged that he has invented a new and useful improvement in machinery for making mouldings, which he states has not been known or used before his application; has affirmed that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Alfred T. Serrell, his heirs, administrators or assigns, for the term of four-

teen years from the sixteenth day of May, one thousand eight hundred and forty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Alfred T. Serrell in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this sixteenth day of May in the year of our Lord one thousand eight [SEAL] hundred and forty-eight, and of the independence of the United States of America the seventy-second.

JAMES BUCHANAN,
Secretary of State.

Countersigned, and sealed with the seal of the Patent Office.

EDMUND BURKE,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these Presents may come:

Know ye that I, Alfred T. Serrell, of the city of New York, cabinet maker, have invented and made and applied to use certain new and useful improvements in the construction, arrangements and conjoint action of well-known mechanical parts, employed with parts invented or improved by me, for producing wood mouldings, being formed with smooth surfaces that will not wrinkle when painted or welted, and become what is termed "woolly faced." The means employed in said improvements enable me to make such mouldings with a saving of materials in the conversion, with a reduction in the amount of labor, by which the public are furnished with such articles at a less cost than the same can be made for by hard labor, and with a uniformity of sectional shape and finish of surface that renders such mouldings more effective and acceptable in general use than others; for which im-

provements I seek letters patent of the United States; and that the said improvements are constructively and substantially set forth and shown in the following description, and in the drawing annexed to and making part of this specification, wherein fig. 1 is a general plan of a machine complete for use. Fig. 2 is a sectional front elevation through the line A, B, of fig. 1, to remove the framing and show the parts that would otherwise be hid. Fig. 3 is an end elevation at the end A of fig. 1, and fig. 4 is a sectional elevation through the line C, D of fig. 1. The figs. 5 to 10, inclusive, represent the general manner in which the wood material is first sawed up, and the position and points of operation of the feeding rollers as they work on the moulding strips as these are used to form various patterns of mouldings. The same letters and numbers, as marks of reference, apply to the like parts in all the several figs., wherein E is the frame of wood or metal fitted to support a bed of metal, *a*, formed as a T, the middle piece crosswise; this is to be so shaped and fitted as to receive the working parts. F is a metal bed fitted to slide lengthwise on the bed *a*, and secured by clamp screws, 1, 1, so as to adjust the feed roller close to the rotary cutters, which screws go through slots in the bed *a*. The bed F has on one end a fixed fence, *b*, which is to guide the stuff into the machine by an adjustable spring, 2, pressing the strip of wood against the fence *b*. The outer end of the bed F is countersunk to receive a metal or wood plate, *b*.1, let in so as to be flush with the surface, and held in place by two small lugs on the inner end, taking indentations in the bed F, and has at the outer end a set screw, *b*.2, going through the bed F, which raises the outer end to any required height, while the inner end remains even with the face of the bed for a use to be shown hereafter. 3, 3, are two pair of metal standards carrying journal boxes, 4, 4, taking the journals of a shaft, 5, which is prolonged outside the machine to receive a drum, *c*, with a belt going to the power through a pair of conical drums, by means of which the speed is regulated, and carries in the middle, between the standards 3, 3, the feeding roller *c*.1, which is formed of one or more flat rings or discs with serrated edges of diameters varying with the depth at which each is to work, cut either bevelling or straight and keyed. The journal box has two lugs, taking set

screws, *x*, to regulate the point to which they shall descend, and outside the boxes 4, 4, the shaft 5 receives two slings, 6, 6, secured to the boxes 4, 4, and descending beneath the bed *a* to receive an adjustable cross piece 7, taking a lever and weight *c*.2, on a fulcrum, 9, on a standard in the bed *a*; the end of the lever receives a strap, 8, which goes over a roller on the under side of the bed *a*, and serves to raise the lever and weight *c*.2, and feed roller, and stop the feeding of the material into the machine, and is held by a pin going through holes in the strap 8. The shaft 5 receives a pulley, 10, with a band going to the double grooved pulley *c*.3, which is sustained by the band on the pulley 10, and has a sling going to a lever and weight, *c*.4; on a fulcrum, 11, on the frame E, the sling has, over the grooves in the pulley *c*.3, two screws, 12, the points of which serve to remove the dust and chips that may fall into the pulley grooves; the band passes up over a pulley 13, on a shaft, 14, in the bed F, and down again to the pulley *c*.3, and is then joined on the pulley 10 to the other end of the band; the shaft 14 carries a roller, *d*, let in flush with the bed F under the feed roller *c*.1; and to allow a free motion to the roller *d*, the bed *a* is hollowed down as shown in fig. 2.

The middle part of the bed *a* receives a sliding bed, *e*, going across the machine, which is held in place by a clamp screw, 15, in slots in the bed *a*, and is adjusted by a set screw, 18, going through a lug, 16, on the bed *a*, and operating in a lug, 17, on the bed *e*. The bed *e* carries at each end a pair of metal standards, *e*.1, formed as slides to receive sliding boxes, 19, each with a lug on one side taking a set screw 20 going through a lug on the bed *e*; by this screw the sliding boxes 19 are adjusted vertically, their tops being formed as a box, *e*.2, to receive a journal box, *e*.3, secured by screws going through slots formed lengthwise of the box. The box *e*.2 carries a set screw, 21, operating against the end of the journal box *e*.3, which on the opposite side is bored out to receive a block or peg of hard wood. A journal thus constructed in each pair of standards receives as a centre in the block of wood, in the box *e*.3, the ends of the shaft *f*, which has a drum, 22, to be connected to any competent power by means of which it is driven at the proper speed, and carries near the end, by the bed F, a cutter block, *g*, with any convenient number of

arms with their ends formed flat at nearly a right angle to the radial line, and on each side edge of the bed thus made are heads, 23, forming slides that receive the cutter tools 24, with the cutting edge so formed as to produce the required shape of the moulding. When operating on the wood, the middle of the cutter has a slot running to the back of the cutter, which receives a screw, 25; this passes through a steel cap, 26, which is set on outside the cutter 24 to take the strain; this screw 25 passes through the slot in the cutter 24, and into the blocks *g*. By this construction, whenever any cutter has to be sharpened or replaced, the screw 25 is to be slacked up sufficiently to withdraw the cutter 24, which can replaced or changed without detaching the cap 26 or screw 25. The bed *a* carries beyond the cutter heads a second fixed fence, *g*.1, by the side of which is a common moulding plane, *h*, of the pattern to correspond with that produced by the rotary cutters, fixed as close to the cutters 24 as convenient, and has a hole bored through the sides near the centre to receive a bar, 27, which has a thread to carry a nut setting against one side of the plane *h*. One end of this bar is turned smaller, with a shoulder on the outer end, two sides of which are cut away, which goes through a slot in a screw stud, 28, so that on putting the shaft through the slot and giving it a quarter-turn the remainder of the collar will hold it in place to be adjusted vertically by a screw, 29, going through the upper part of the slot in the stud 28, or by turning the screw stud 28 when the bar is not in it. A slide, 30, on the inner edge of the bed *a*, receive and hold the shaft 27, and allow of its vertical motion, and pressure is given to the plane *h* by a weight, 31, on the outer end of the bar 27.

Beyond this the bed *a* is hollowed down to receive on one side three fixed slides, *i*, which are jointed near the outer edge of the bed *a*, to three similar slides, *i*.1, by hinges 32, which are connected together and sustained and adjusted by a screw, 33, on the part *i*.3 of the bed *a*; and the bed *a* is removed near the middle to prevent any substance lodging to choke the working of the sliding beds *k*, *k*.1, *k*.2 and *k*.3, which set in the slides *i* and *i*.1; the first two carry stocks, 35, for plane irons, 36, to form roughing tools, and the second two beds, *k*.2, *k*.3, receive similar stocks and cutters, operating as

smoothing tools, and each plane is fitted with a lug, 34, in front of the iron to form the face. To the under side of each of the beds *k* and *k*.2, is a strap or cord, 40, attached, which passes over a pulley, 41, in the outer edge of the slide *k*.1 or *k*.3, and descending, sustains a weight, 42, each of which serves to draw both pair of beds, *k* and *k*.1, and *k*.2 and *k*.3, towards each other, which is stopped at any required point by screw-bars, 37, with a nut on one part and a collar a short distance from the other, and going through holes in lugs, 38, on the plane stocks 35, so that the planes will separate by the bar sliding in the hole, but will not approach each other within a certain adjustable point by the collar taking the lug 38. When thus constructed and adjusted for use, the material *o* is to be laid on the plate *b*.1, which is to be raised to the proper height by the screws *b*.2, and the stuff shoved under the feed roller *c*.1, which operating on the wood presses it on to the bed which is not a straight line, thus making the spring of the wood hold the end down against the operation of the rotary cutter 24, at the same time forcing it forward by its rotary motion; the edges of the feed rollers taking into the strip to form the mouldings in the parts to be removed by the cutters, as shown by the blue lines in figs. 5, 6, 7, 8, 9 and 10, forces it on against the operation of the rotary cutter which forms the wood into the required shape; thence the moulding passes under the fixed moulding plane *h*, which is kept in its place and pressed down by the bar 27 and weight 31, and is smoothed, a complete shaving being taken off as it passes beneath; thence the strip passes between the planes 36, the first two taking a rough shaving off each edge, the second two smoothing, and the complete moulding passes out by the guide fence 39, and is thus ready for use. The screw 33, operating under the slide frame *i*.1, adjusts by turning it vertically on the hinges 32, so that if the thickest edge of the moulding is to be bevelled at more or less than a right angle with its bed, it can be done so without disturbing any of the apparatus.

The figs. 5 to 10 show by red lines the general manner in which I saw out my strips for forming mouldings, as by this means considerable wood is saved in the conversion into mouldings, the sawing being effected by one or more diagonal cuts by a circular saw.

It will be further seen, that by the formation and changeable adjustment of the feeding rollers, they operate so as to stick into those parts only that are to be removed by the rotary cutters; by this means the new and useful effect is produced of saving material, first by cutting out two mouldings from one strip; but this alone would not be effective without feed rollers that act as shown, by not bruising the part that is to remain, and thus saving the amount that would otherwise be wasted by any feed roller operating equally all over the surface, or partially on the highest part of the moulding instead of the part that is to be taken out.

I do not claim to have invented grooved feed rollers to force in the material to be moulded, but I do not know of any previous machine in which such a roller has been applied, of either of one or more rings or discs that operate to feed the material into the machine, by contact with the part that has to be removed by the cutters. Neither do I claim the rotary cutter for forming mouldings nor a common moulding plane; but I do not know of any machine in which these have been combined together, with a means of maintaining an equal pressure of the plane on the moulding beneath. Therefore what I claim as new and of my own invention, and desire to secure by letters patent of the United States, is the application of the changeable feeding rollers *c*.1, made as discs or flat rings, with serrated edges of varying angles and changeable or unequal diameters, to feed in materials cut in varying or irregular sections, in combination with changeable rotary cutters and changeable standing planes, to produce wood mouldings of different sizes, with smooth surfaces, from material cut or prepared in varying or unequal sections for such purposes. The whole applied, constructed and operating substantially in the manner and with the effects described and shown.

In witness whereof I have hereunto set my hand, this eleventh day of December, one thousand eight hundred and forty-six.

ALFRED T. SERRELL.

Witnesses,

HORACE P. RUSS,

GEO. W. REID.

Ex'd.—L.P.H.

DEFENDANT'S EXHIBIT Ah.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH E. ANDREWS, NO. 4283, DATED NOVEMBER 21, 1845.

[PUT IN EVIDENCE, PAGE 364, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph E. Andrews, Boston, Massachusetts, has alleged that he has invented a new and useful improvement in planing machines, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph E. Andrews, his heirs, administrators or assigns, for the term of fourteen years from the twenty-first day of November, one thousand eight hundred and forty-five, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Joseph E. Andrews in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed

Given under my hand, at the city of Washington, this twenty-first day of November in the year of our Lord one thou-
[SEAL] sand eight hundred and forty-five, and of the independence of the United States of America the seventieth.

JAMES BUCHANAN,
Secretary of State.

Countersigned, and sealed with the seal of the Patent Office.

EDMUND BURKE,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Joseph E. Andrews, of the city of Boston in the State of Massachusetts, have invented certain new and useful improvements in the manner of constructing a machine for the planing and jointing of boards and plank; and I do hereby declare that the following is a full and exact description thereof: —

In my machine the board or plank to be planed is placed upon an endless horizontal platform, consisting of lags or slats of iron, which are hinged together in the manner of some endless floors or platforms for horse powers. This platform passes round rollers at its ends, one of which is made to revolve by suitable gearing, and thus to advance the board or plank that is placed upon it. The upper side of the endless platform runs upon ways, by which it is sustained and kept from *swagging;* above this revolving platform I place other endless platforms or aprons, usually four in number, which are constructed somewhat like that already described; but instead of making them entirely of iron, I form them of leather or other suitable material, and across these I place lags or slats of iron, extending from side to side of the aprons, half an inch or an inch apart, and riveted thereto; these slats may be half round, their flat sides being towards the apron, their rounded ones being intended to form a number of continuous and successive bearings on the board which is being operated upon. These endless aprons, like the plat-

form, turn upon rollers at their ends, and their lower sides bear against ways, which cause the slots to press upon the board the whole length of the apron.

I generally construct my machine so that it may plane a board of considerable width, say of eighteen inches, more or less; but in such a machine, boards less than half this width may be passed through, two at a time, resting on the same platform, and being dressed by the same revolving cutter.

My upper endless aprons are usually, as above stated, four in number, two of which are in advance and two in the rear of the planing wheel; each of these aprons occupies but about one half of the width of the machine; these have each its own frame, within which are the rollers upon which the aprons revolve, and they are received in compartments, in an independent frame, situated immediately above the revolving platform; this independent frame sustains the planing wheel also, and it is so arranged as that it may be raised or lowered at pleasure, for the purpose of adapting it to stuff of different thicknesses.

My planing wheel I place obliquely across the machine, by which means it is made to cut more smoothly than when the cutters stand at right angles with the sides. The precise angle which the axis of the planing wheel makes with the sides of the plank or of the machine is not a point of importance, and may be between twenty and forty degrees, but it should be such as to cause the cutters to operate as skew irons. The planing wheel may of course be made to stand straight across, as in other machines, but the oblique position is much to be preferred.

In the machines heretofore in use which were furnished with a revolving planing wheel, the cutters, if placed obliquely, would have caused the boards on which they acted to shift laterally; but the firm pressure to which the board is subjected between the platform and the endless aprons, constructed in the manner above described, effectually counteracts any tendency to lateral movement.

The jointing I effect by means of circular saws, which operate upon the board as it is leaving the planing machine. These circular saws are placed on a shaft which crosses the machine in front of the

revolving platform. The number of saws to be placed on it will depend upon the number of pieces into which the planed board is to be divided; when two boards are being planed at the same time, and they are each to be jointed on their edges, four saws will be required; when a wide board is to be cut into four (4) narrow ones, five saws will be necessary. It is a point of great importance to be able to shift these saws readily upon their shaft, so as to adapt them precisely to the width of the stuff to be cut. To effect this, I place one, two or more of the saws upon hubs that are made to slide truly on the shaft, and to revolve with it, by means of a feather; these saws I shift, as desired, in the following manner: I place as many adjusting shafts across the machine as there are shifting saws; upon these shafts I cut a screw thread, and adapt to them screw sockets or sliding nuts, from which short arms proceed, the outer ends of which are received into grooves surrounding the hubs of the shifting saws, and by turning the screw shaft appropriate to either of the saws, it may be instantaneously shifted to the point desired.

In the accompanying drawings, fig. 1 is a side elevation of my machine; fig. 2 is a top view of it, and fig. 3 a longitudinal vertical section thereof, in the line x, x of fig. 1. In each of these figures, where the same parts are shown, they are designated by the same letters of reference.

A is a whirl on the main shaft B, to which the power may be applied from the first mover; C is a whirl on the opposite end of the shaft B, from which a band, D, proceeds, and gives motion to the vertical shaft, E; a worm-wheel, F, on the upper end of this shaft, takes into the wheel G, on the end of the front roller of the revolving platform, and gives motion thereto, there being teeth on said roller, which take into the spaces between the lags or slats of the platform; H, H are the gudgeons of the platform rollers H′, H′; a, a are the iron slats of said platform, which are connected together by hinges, n, n, n. The arrangement of these is shown distinctly in the section fig. 3; J, J is one of the ways that sustains the upper side of the platform, and upon which it slides.

K, K is the independent frame which sustains the planing wheel, and within which are contained the endless aprons L, L that serve

to press on the board or boards; each of these aprons has its own frame, *b*, *b*, that drops into compartments between the framework of the independent frame; one of these frames is left off on the top view to show the slats *a*, *a* beneath them. The gudgeons of the rollers O, O, on which the endless aprons L, L run, have their boxes in the frames *b*, *b*, and these frames are capable of moving up and down in their respective compartments, within the independent frame; *e*, *e*, *e* are spiral springs that bear upon the frames *b*, *b*; elliptic or other springs may, however, be substituted for these; *d*, *d* is the leather part of the endless apron, and *l*, *l* the iron slats riveted thereto, which by their number and form clasp and hold the board firmly under the action of the springs by which they are pressed down. The independent frame may be fastened to the main frame by screw bolts, *f*, *f*, passing through the pieces K, K, making a part of said frame. This frame may be raised or lowered by screws bearing against the lower ends of the pieces K′, or by cams on shafts crossing the frame of the machine, or in other modes well known to machinists.

M, M is the revolving planing wheel which does not differ materially from those in common use. When the machine is intended for planing wide stuff, the cutters must each be in one piece, as represented in the drawing; but in those places where it is to be used for planing flooring boards only, or other narrow stuff, the cutters may, if desired, be divided into two lengths. I have represented the planing wheel as placed obliquely, in the manner and for the purpose above made known. I surround the cutter wheel in part by a guard plate, *g*, *g*, to prevent the scattering of the chips; but in the top view I have omitted this, in order to show the planing wheel the more distinctly; but it is shown in the section.

N, N is the saw or jointing shaft, having on it the saws O, O, O, only one of which, O′, is represented as adjustable, this being sufficient to exhibit the manner of moving them. P is a shaft having a screw thread cut on it, and Q a nut or female screw fitted thereto; from this proceeds the arm R, the outer end of which is fitted to enter a groove, *h*, on the hub S of the saw. Under this arrangement it will be seen that, if the shaft P be turned by means of a

winch or otherwise, the saw may be made to slide to any desired part of the shaft N. The saw shaft may be driven by a band, *j*, embracing the whirls K and *l*. As the planed board escapes from the revolving platform it meets the saws O, O and is slit and jointed in the manner required. As the boards or strips leave the saws they are carried between the rollers T, T, one of which is represented as driven by a band, *m*, which causes the boards or strips to be carried clear of the saws.

In entering the boards upon the platform and under the endless aprons, for the purpose of being planed, care is to be taken that they are entered in a direct line, which is easily done by placing their outer edges against guide pieces, and after they have been thus entered no fear need be entertained that they will deviate from the straight path, the nature of the parts between which they are passed being such that a very considerable degree of force would be necessary to cause them to move laterally.

Having thus fully described the manner in which I construct my planing and jointing machine, and shown how the respective parts thereof operate, what I claim therein as new and desire to secure by letters patent, is the manner herein set forth of forming, arranging and combining with the revolving cutter wheel the revolving platform and the endless aprons between which the board to be planed is to be passed, by means of which arrangement and combination it is firmly held along the whole length of such apron and carried regularly forward, without deviation.

JOSEPH E. ANDREWS.

Witnesses,

THOS. R. JONES,

EDWIN L. BRUNDAGE.

Ex'd. — C.C.W.

DEFENDANT'S EXHIBIT Ag.— D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED CHARLES W. BROWN, NO. 3704, DATED AUGUST 14, 1844.

[PUT IN EVIDENCE, PAGE 364, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Charles W. Brown, Boston, Massachusetts, has alleged that he has invented a new and useful improvement in tonguing and grooving machines, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Charles W. Brown, his heirs, administrators or assigns, for the term of fourteen years from the fourteenth day of August, one thousand eight hundred and forty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Charles W. Brown in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this fourteenth day of August in the year of our Lord one thousand eight [L.S.] hundred and forty-four, and of the independence of the United States of America the sixty-ninth.

J. C. CALHOUN,
Secretary of State.

Countergisned, and sealed with the seal of the Patent Office.

E. G. SMITH,
Acting Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these Presents shall come:

Be it known that I, Charles W. Brown, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and useful improvement in the tonguing and grooving apparatus of planing machines, and that the following description taken in connection with the accompanying drawings, hereafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvement, by which my invention may be distinguished from others of a similar class, together with such parts or combinations as I claim and desire to have secured to me by letters patent.

My improvement has for its object and purpose the tonguing and grooving of boards of various widths, and superseding the necessity of an adjustment of one of the cutting tools for each board that is to be operated upon; it is peculiarly adapted to the tonguing and grooving of boards of a tapering or irregular shape; and this constitutes the great merit of my invention, as the only requisite preparation of the board before its introduction to the machine is the making of one edge straight.

In the use of the machines which have heretofore been contrived for tonguing and grooving boards, &c., it has been necessary, prior to passing them through the machine, to sort or arrange the

boards of equal widths in piles, and where the boards were of an irregular shape, to saw or reduce them to an equal or even width throughout; this, it will be readily seen, necessarily involved the waste of a considerable quantity of stock, and where the boards were of different widths, required the adjustment of the movable tool for each board; whereas by my improvement, in which said tool is self adjusting, both of these objectionable necessities are effectually obviated.

The figures of the accompanying plate of drawings represent my improvement. Fig. 1 is a side elevation of a planing, tonguing and grooving machine; fig. 2 is a plan with the planing tool or cylinder removed for the better exhibition of the parts beneath the same; fig. 3 is an end view; fig. 4 is a transverse vertical section taken in the plane of the line A, B, fig. 2, and fig. 5 is a detail longitudinal vertical section taken in the plane of the line C, D, fig. 2.

The planing machine with which I have combined my improvements, and which is represented in the drawing, is that familiarily known as the "Woodworth Planing Machine," although my said improvement, it will be seen, may be readily adapted to any of the machines in common use, without the exercise of any inventive faculty.

E, E, E, E, &c., in the several drawings represent the framework of the machine which should be constructed in the ordinary way, either with wood or iron. F is the planing cylinder, the journals of which have proper bearings at *a*, *a*, the said cylinder being revolved by means of a band passing from a pulley, C, fig. 4, on one journal of said cylinder, to the driving drum or shaft *d*, *d*, the journals of which rest and revolve in proper bearings in the framework E, E, E. The feed roller *e*, *f*, *e*, *f*, figs. 2 and 5, on each side of the cylinder are arranged as in the "Woodworth Machines," the upper rollers *e*, *e* serving as pressure rollers to keep the plank or board to be planed from being drawn up by the action of the knives of the planing machine. With this view the journals of the roller *e*, *e* rest and revolve in the movable boxes *q*, *q*, *q*, *q*, which are pressed down by means of the weighted levers *h h*, *h h*, *h h*, *h h*, arranged as shown in fig. 2.

The lower rollers *f*, *f* are driven by means of cogged wheels, *i*, *i* (on one of their journals), which are connected to a revolving shaft, *k*, by means of the cogged pinions *l*, *l*, *l*, the arrangement of which will be understood by inspection of fig. 2, the centre pinion *l*, of the three being on the end of the shaft *k*, said shaft being revolved by a band from the driving drum.

m m, *n n*, are two longitudinal stationary guides having perfectly straight edges, and fastened to the transverse bed pieces *o o*, *o o*, *o o*, &c., fig. 2, placed at proper intervals from the front to rear of the machine, and also to the bed piece *p*, *p*, figs. 2, 4, 5, directly under the planing cylinder.

These guides are for directing the edge of the board, *which has not been made straight before its introduction to the machine;* that denoted by *n*, *n* being placed a little nearer to a centre line, drawn longitudinally through the machine, than that on *m*, *m*, the edges of the two guides regulating the quantity to be cut from the edge of the board by the grooving tool to make the same straight, *as in the machines in common use.*

The revolving grooving tool *g*, figs. 2 and 4, is arranged in the ordinary way, on the top of a vertical shaft, *r*, the journals of which have stationary bearings, and said shaft being revolved by a belt from the driving drum. The revolving tonguing tool *s* is also arranged on the top of a vertical shaft, *t*, which shaft turns in bearings which are arranged to slide laterally as follows: the foot of the shaft *t* rests and turns in a proper step in the horizontal sliding piece *u*, figs. 1, 4 and 5, said piece being connected to the bar *y*, and through the medium of said bar, to the upper bearing block *v* of the shaft, by the vertical bar *w*. The bearing block *v* slides laterally on the rail *x*, fig. 2, which rail *x* is in front of and attached to the bed piece *p*, *p*; a bar, *y*, fig. 5, fitted to slide underneath the bed piece *p*, *p*, extends longitudinally under the bed piece *p*, *p*, to a sliding block, *b'*, which moves on the rail *c'*, on the front side of the bed piece *p*, *p*.

The adjustable guide bar *d'*, figs. 2, 5, of the tapering or wedging shape shown in fig. 2, is firmly connected to the top of the movable bearing block *v* and sliding block, *b'*, and this bar *d'* comes up

and bears against the straight edge of the board to be planed, &c., all of the parts above described as connected with the tonguing tool, &c., moving together laterally, as will be readily understood without further explanation. *The above-described arrangement will be seen more clearly and on a larger scale in fig.* 6. The arrangement of mechanical devices for rendering the guide bar *d* and tonguing tool *s* adjustable is all that remains to be described of my improved apparatus. It is as follows: a rack bar, *e'*, is secured at one end to the bar *y*, which is connected to the guide bar *d'*, as hereinabove set forth, the said rack bar extending through proper slots in the framework to one side of the machine, as shown in figs. 2 and 4. A cogged pinion, *f'*, figs. 1 and 4, engages with the teeth of the rack bar *e'*, and is firmly fixed on one end of a long shaft, *q'*, *q'*, which extends to the rear of the machine, as shown in fig. 2, having proper bearings on the side of the framework E, E. On the rear end of this shaft is a pulley, *h'*, figs. 1, 2, 3, having one end of a cord or band attached to its periphery, the other end of which cord suspends a heavy weight, *l'*, figs. 1 and 3. This weight thus arranged, it will be seen, when left free to act, will cause the shaft *g'*, *g'*, and pinion *f'*, to turn and move the rack bar *e'* and guide bar *d'* laterally, until the inner slide of the latter comes in contact with the straight edge of the board to be operated upon, against which the weight will keep it; and it will also be seen that if the board be of a tapering or wedge shape, it will counteract the effect of the weight, and press the guide bar *d'* outwards (if the smaller end of the board be presented first to the machine), so that the grooving wheel will work without reducing the width of the board.

When the board has passed entirely by the cutter, the weight, &c., is prevented from pressing the guide bar *d'* further inwards, by the following arrangement of machinery: a ratchet wheel, *k'*, figs. 1, 2 and 3, is arranged on the shaft *q'*, *q'*, in juxtaposition to the pulley *h'*, and a pawl or series of pawls, *l'*, is arranged on the end of the block *m'*, the end of which pawl engages with the teeth of the ratchet wheel *k'*. The right-angular arm *n'*, *n'*, on one end of turning rod *o'*, *o'* is arranged under the pawl *l'*. The rod *o'*, *o'* has suitable bearings attached to the under side of the transverse

bed pieces *o o*, *o o*, and extends along nearly to the edge of the bed piece *p*, *p*, where it has another right-angular arm, *p'*, *p'*, shown by dotted lines in fig. 2, which comes under the bed piece, *p*, *p*, having a spring, *q'*, fig. 2, which keeps it against the under side of said bed piece, or so that it will not act to throw the pawl *l'* out of connection with the ratchet wheel *k'*, unless it is pressed down by the vertical sliding bolts *r'*, *s'*, figs. 2 and 5.

These bolts are shaped on their upper ends like the common bevelled bolts of a door lock, and move up and down in slots in the bed piece *p*, *p*, the bottoms resting on the top of the arm *p'*, *p'*, or connected to the same.

These bolts are arranged in a line of each other, and at some distance apart, the front one *s'* being as near as it can be to a line drawn through the points where the tonguing and grooving tools would strike the edges of the board, the object of which arrangement is as follows: when the front end of the board comes in contact with the first bolt *r'* it depresses it, and consequently turns the rod *o'*, *o'*, throws the pawl *l'* out of connection with the ratchet wheel *k'*, and allows the weight *i'* to act as hereinabove set forth, and carry the guide bar *d'* against the edge of the board or plank. The under side of the board, it will seen, as it passes over the bolts *r'*, *s'*, keeps them down and keeps the pawl *l'* out of connection with the ratchet wheel *k'*, leaving the guide bar *d'* and tonguing tool *s* free to move as the edge of the board may press them until the rear of the board escapes from the front bolt *s'*, when the pawl is left free to engage with the teeth of the wheel. The necessity of the second bolt will be apparent when it is stated, that if there were but one bolt, when the end of the board left it, after passing in the direction indicated by the red arrows in fig. 2, that portion of the board which remained to be grooved, &c., would, if it were tapering, be cut or torn at the angular part, as it is requisite that the first bolt *r'* should be placed at some distance in rear of the tonguing tool in order to give the guide bar *d'* time to advance to the edge of the board after the pawl *l'* has been thrown out from the ratchet wheel *k'*, before the said tool begins to act. It will be evident that

either the tonguing or grooving tool may be made adjustable as above described.

Having thus set forth and described my improvement, I shall state my claim as follows:—

What I claim as my invention and desire to secure by letters patent, is, making either the tonguing or grooving tool self-adjusting by arranging the box or bearing of the shaft of either of the said tools so as to slide laterally on a rail, and connecting said box or bearing to a sliding guide bar, d', which bar is governed or regulated in its movements by the edge of the board, and kept up against said edge by means of a weight operating on it (so as to press it laterally) through the medium of a rack and pinion as hereinbefore set forth, the mechanical arrangement and operation being substantially as hereinabove specified; I also claim the combination of the sliding bolts r', s' with the turning rod o', o' (having right-angular arms, n'', n', p', p') and pawl l' and ratchet wheel k' on the end of the shaft which the weight i turns or revolves, said combination being arranged substantially as hereinbefore set forth, and for the purpose of permitting or checking the operation of said weight i' upon the sliding guide bar d', as hereinbefore specified.

In testimony that the foregoing is a true description of my said invention and improvement, I have hereto set my signature this twenty-ninth day of July in the year eighteen hundred and forty-four.

CHARLES W. BROWN.

Witnesses,

E. LINCOLN, JR.,

FRAS. J. HUMPHREY.

EX.—J.A.W.

DEFENDANT'S EXHIBIT Af.—D.B.H., Special Examiner.

CERTIFIED COPY FROM THE PATENT OFFICE OF THE UNITED STATES OF THE ENGLISH LETTERS PATENT GRANTED WILLIAM HICKLING BURNETT, NO. 7926, DATED JANUARY 8, 1839.

[PUT IN EVIDENCE, PAGE 364, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy, from the bound volumes of the library of this office, of the specification and drawing in the matter of the English letters patent granted William Hickling Burnett, dated January 8, 1839, No. 7926, for "Improved Machinery for Sawing, Planing, Grooving and otherwise Preparing or Working Wood for certain purposes."

In testimony whereof I, W. H. Doolittle, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this fifteenth day of June in the year of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth. [SEAL]

W. H. DOOLITTLE,
Acting Commissioner.

A.D. 1839 . . . . No. 7926.

MACHINERY FOR SAWING, PLANING AND GROOVING WOOD.

Burnett's Specification and Disclaimer.

SPECIFICATION.

To all to whom these Presents shall come:

I, William Hickling Burnett, of Wharton street, Bagnigge Wells Road in the County of Middlesex, gentleman, send greeting.

Whereas her present most excellent majesty Queen Victoria, by her letters patent, under the great seal of Great Britain, bearing date at Westminster, the eighth day of January in the second year of her reign, did, for herself, her heirs and successors, give and grant unto me, the said William Hickling Burnett, her especial license that I, the said William Hickling Burnett, my executors, administrators and assigns, or such others as I, the said William Hickling Burnett, my executors, administrators or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise and vend, within England, Wales and the town of Berwick-upon-Tweed, and also in all her majesty's colonies and plantations abroad, my invention of "*New and Improved Machinery for Sawing, Planing, Grooving and otherwise Preparing or Working Wood for certain purposes;*" in which said letters patent is contained a proviso obliging me, the said William Hickling Burnett, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said invention, and in what manner the same is to be performed, and to cause the same to be enrolled in her said majesty's high court of chancery, within six calendar months next and immediately after the date of the said recited letters patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

Now know ye, that in compliance with the said proviso, I, the said William Hickling Burnett, do hereby declare the nature of my said invention to consist in certain arrangements of planes, saws and other wood-cutting instruments in combination with machinery, constituting machines for preparing boards or scantlings for floorings, skirtings and the like work; and for panels, stiles and rails of doors, shutters and the like work; and also machines for mortising and tenoning, and machines for running out mouldings, sash bars and the like work; and also a machine for sawing wood into triangular strips, for the purpose of being afterwards converted into mouldings and the like work; all which machines are generally applicable, with slight modifications, to various portions of carpenters', joiners', cabinet makers' and millwrights' work. And in further com-

pliance with the said proviso, I, the said William Hickling Burnett, do hereby describe the manner in which my said invention is to be performed, by the following statement thereof, reference being had to the seven sheets of drawings annexed, and to the figures and letters marked thereon, respectively, it being noticed that in the description of each machine comprised in the said drawings similar letters are used to denote similar parts wherever they occur; but it is to be observed, that as there are several different machines described, so there are several series of letters and figures used. The drawings of each of these machines are made to a particular scale, which will be mentioned when describing them; for each I have selected what I consider a convenient general size; but it will be obvious that in all of them it may be desirable and is easy to increase or diminish that scale, to suit them to the work for which they will be chiefly intended, and that I therefore by no means bind myself to any particular dimensions; and although I frequently mention the materials of which different parts of the machines are to be made, I do not confine myself to them, as they will often require to be varied, from economical or other causes. In the various machines for planing, moulding, running out sash bars and angular sawing, I have only shown the working portions; and it will suffice to state here, once for all, that it is to be understood that benches, or a series of friction rollers, or other convenient supports, should be placed on either side of the machines for the wood to be placed on and travel along.

I shall now proceed to describe, in order, the different portions of the machinery which I have invented, commencing with sheet No. 1, a planing machine. Figures 1, 2, 3, 4 and 5, sheet 1, show, respectively, figure 1, a top view; figure 2, a side view; figure 3, a transverse section at *a*, *a*; figure 4, a transverse section at *b*, *b*; figure 5, a front view of a machine for cutting wood into the various forms required for flooring boards, either simple or tongued, and grooved skirtings, architraves and other similar objects.

The letters *a*, a', a^2 show the general framework of the machine; the parts a' should be firmly bolted to the floor, the columns *a* serving as supports to the cross pieces a^2; *b* and b^1 are rollers made

of cast iron or other suitable materials; b are the driving rollers which are intended to force the wood through the machine.

The rollers b serve to press the wood W firmly against the driving rollers, thereby giving them the bite necessary to enable them to carry it forward. There are two pairs of these rollers, one pair at either end of the machine; slots or openings, c, are made in the transverse pieces of framing a^2, in which the bearing blocks of the driving rollers are fixed, and in which the bearing blocks of the pressure rollers may be moved backwards and forwards, carrying the rollers with them, so as to accommodate the distance between them and the driving rollers to any thickness of wood that may be operated on. The degree of pressure given to the rollers b^1 is regulated by turning the screws d, and thus forcing their ends against the spiral springs e, which press upon their bearing blocks f; a perfectly similar arrangement is used in the moulding and sash-bar machinery, which will be hereafter described, and as their figures are drawn to a much larger scale than those of the machine now under consideration, the thing will be better understood by consulting them; g are standards supporting a rail, h, over which the wood will travel.

The workman having placed the piece of wood intended to be wrought upon the rail h, he must introduce its end between the first pair of rollers, which in turning will carry it through in the direction of the arrows. Immediately after passing through the first pair of rollers, the wood will come in contact with the surfacing planes, which will smooth one or both surfaces, as may be required. I shall therefore now proceed to describe these planes and their adjustments; i is a bed similar to the bed of an ordinary turning lathe, supported at its ends by standards, j, firmly bolted to the floor. This bed is formed with V slides, on which are accurately fitted the heads k; these heads are in every respect similar to the mandrel head of an ordinary turning lathe, and are fitted with collars, mandrels and pulleys. On the noses of these mandrels are cut screws, to which are fitted the planing chucks. It will be observed by the figures that these heads are turned in opposite directions, so as to bring the chucks face to face, and that they may be approximated

towards or drawn back from each other, in order to suit them to any thickness of timber that may be required to be operated on. This sliding motion of the heads is effected by means of the screwed nuts affixed to the bottom of the heads through which pass screws; these screws being turned by handles move the heads, as the tool holder of a slide rest is moved; *l* are the mandrels, *m* the pulleys in the screws, and *o* the handles I have just described. By means of the bolts and nuts *p*, the heads may be firmly fixed when properly adjusted.

The planing chuck and its cutters are shown to half the real size in figures 8 and 9 of this sheet, and the preparing cutters to the full size in figures 10 and 11. The right-hand half of figure 8 is the side view of the plane; the left-hand half a section through the plane; the right-hand half of figure 9 is the back view of the plane, and the left-hand half the front view. Figure 10 is a side view, and figure 11 a front view, of one of the cutting tools. This plane, it will be perceived, consists of a series of hooked cutters or gouges, 1, placed upon the periphery of the chuck, which cutters or gouges serve to take off the rough surface from the wood, and reduce its place to a sufficiently perfect level for the plane iron or irons 2, which are set nearer to the centre and somewhat ranker, to take off a fine shaving and finish the work. These planes or cutter chucks, which are indicated by the letter p^1, in the various views of the machines, when duly placed with regard to the wood, are made to revolve with great rapidity by means of endless bands passing over the pulleys *m* from any first mover. The rollers, of course, are required to move at a much slower rate, which they are made to do in the following manner: *q* is a pulley fixed on to the end of the shaft q^1, which is supported in bearings at q^2; an endless band passes round this pulley from any first mover, gives motion to it and to its shaft, at the other end of which is cut a screw which works into the wheel *r*; on the shaft of this wheel is a pinion, *s*, which turns the wheel *t*. This wheel is affixed to the shaft of the first driving roller *b*, and thus turns it at a velocity regulated by the number of teeth in the wheels *r* and *t* and in the pinion *s*; this velocity will of course be varied according to the nature of the wood for which the machine is chiefly intended,

and also according to the relative diameter of the driving rollers and the circular planes. I find about one sixteenth of an inch advance for each cut of the gouges a good average quantity. Upon the end of the first driving roller *b* is a bevel wheel, *u*, which gears into a corresponding bevel wheel, u^1. This is attached to and turns a shaft, *v*, properly supported on bearings, v^1, which communicate the motion to the second driving or pulling roller *b* by means of another pair of bevel wheels, u^2 and *u*; the wood having passed the surfacing cutters, before described, will next come in contact with the other cutters, also circular in their motion, which will form the edges of the wood to a plain surface, or will tongue and groove them, if required, for flooring boards or other similar purposes, or mould them, if for skirtings or other objects requiring to be so prepared. The wood W shown in the different views of the machine, is under the operation of tonguing and grooving cutters, the upper edge being grooved, whilst the lower one is being tongued. A pair of cutters for these purposes is shown to a larger scale in figures 6 and 7, sheet No. 1, where figure 6 shows the grooving cutter, and figure 7 that for tonguing. Those cutters are each formed of three elliptical saws set askew upon their shaft in such wise that the cutting edges of each saw shall all be portions of the surface of the same cylinder. The width of the tongue or groove is regulated by the angle of inclination of the cutters to the shaft, the degree of its ellipticity, and the thickness of the washers; the depth is regulated by the relative sizes of the saws employed. This will all be sufficiently obvious to any workman by consulting the drawings, where 3 represents the saws, 4 the washers, 5 the chuck, and 6 the nut that holds them on the shaft of the chuck. Although I particularly claim this sort of cutter as my invention, I do not limit myself to apply it alone in the machine, inasmuch as cutters of any other suitable form may be substituted. For instance, different ones are shown in the sectional views of the machine itself; and in figures 3 and 4, 5 and 6, 13 and 14, of sheet No. 7, various tools are delineated, the principle of whose construction will be hereafter described, and which it will at once be perceived may with great facility be applied to this machine. These cutters may be elevated or depressed to suit them to boards of dif-

ferent widths in the following manner: at a^3 on the standard a^1 is formed a slide similar to that part of the ordinary sliding rest on which the tool holder moves; on to this slide are accurately fitted the cutter frames w, best seen in figures 2 and 4. To the under surface of these frames are attached nuts through which pass the screws x; these screws are turned by means of the handles x^1, and in so doing raise or lower them to the required position. The cutter frames are furnished with proper bearing for the shaft of the cutters, as will best be seen by consulting figure 4. On the inner end of the cutter shaft or mandrel q a screw is cut, to which the different cutter chucks are fitted; y represents these cutters' shafts, and z the cutters. These cutters will be made to revolve rapidly by means of endless bands working round the pulleys z^1, which are attached to the shafts. When quick mouldings are required a modification of the cutter frame, shown in the drawings of the machine, may be advantageously used. This modification is shown in figures 11 and 12, sheet No. 7. In it the bearings 1 are added to those already described, and a shaft, 2, is placed at right angles with the shaft before mentioned, and becomes the cutter shaft. On the end of the first-named shaft is a bevel wheel which gears into a corresponding one on the shaft 2, as seen at 3, and turns it. This cutter is shown to the full size in figures 13 and 14. It is composed of a number of circular saws, 4, placed upon the same shaft and screwed up together by the nut 5. In figure 13 the right-hand half of the figure is a section, and the left-hand a front view of one of the saws. The wood after passing these cutters will enter between the second pair of rollers b and b^1, and by them will be carried in a finished state out of the machine. The scale to which the machine in this sheet 1 is drawn is one inch to the foot.

I shall now describe another machine for similar objects to that last explained; figure No. 1, 2, 3, 4, 5 and 6, sheet 2, show, respectively, figure 1, a transverse section at a, a; figure 2, front view; figure 3, transverse section at b, b; figure 4, longitudinal section; figure 5, longitudinal elevation; figure 6, top view of a machine for planing planks and boards of different scantlings on one or both sides and their edges simultaneously, also for running out moulded skirt-

ings, architraves and other similar objects; *a* is the cast-iron framework of the machine. This framing consists of two stout standards, best seen in the longitudinal elevation and section. They are bolted down to the floor, and united to each other by the cast-iron cross pieces *b* and the screw rod *c*. These cross pieces *b* not only serve to tie the standard together, but form also the bed over which the wood W intended to be cut will travel. The motion of the wood is in the direction of the arrows. It will be perceived on examining the figures, and more particularly figure 4, that the pieces *b* are three in number, and range with their upper faces nearly in the same plane, the one nearest the end where the wood enters being the thickness of the required cut below the other two; immediately above these cross pieces or tables *b* are others, *d*, of similar form, which can be elevated or depressed so as to form between them and the pieces *b* gauges or guides for boards of different scantlings. In place of these tables friction rollers might be introduced, but I give the preference to pieces of the shape shown in the drawing, as by their form they can be made to steady the wood at a point nearer to the work than rollers could. In order to oblige the wood the more surely to keep correctly in a right line during its passage through the machine, I fix upon the upper surfaces of these plates *b* small blocks or strips of metal, the inside edges of which should range nearly in a right line with the edges of the cutters of the fixed edging planes, which will be hereafter described. They will serve as permanent guides to one edge of the boards. The opposite edge is steadied by dogs, b^1, best seen in figure 4. These dogs travel in slots in the tables *b*, and are moved backwards and forwards by a screw, as is done in the case of a common universal chuck; the screws are turned by handles, b^2. These movable dogs should be sufficiently near to each other to keep the wood steady, without, however, pinching it so as to form a resistance to it in its passage through the machine. The mode in which the tables are elevated or depressed is as follows: —

Their ends are accurately fitted and made to slide in vertical openings or slots in each frame, and they are tapped with female screws, through which pass the male screws *e*. These screws having the same number of turns to the inch, it is evident that, if the cross

pieces *d* are in the first instance placed parallel to the cross pieces *b*, the screws on receiving simultaneously the same number of turns will elevate or depress the cross pieces *d* any required quantity, keeping them at the same time duly parallel to the tables *b*; the ends of the screws *e* go through the caps *f*, which caps are firmly bolted to the frame *a*, and to their ends above the caps are attached bevel wheels, *g*, which gear into others, *h*, fixed on to the rods *i*. These rods turn in bearings on the caps *f*, and have at one end a handle, *j*. By turning this handle it will be perceived that through the bevel wheels motion will simultaneously be communicated to a pair of the screws *e*, by which the guides *d* will be properly elevated or depressed. In the main standard *a* are other slots or openings in which will be fixed bearing blocks, *k*, which support the roller *l*. This roller it is which will drive the wood W through the machine. To enable it to do this, immediately above it and supported at its ends by other bearing blocks, k^1, is another roller, l^1. This roller is pressed strongly down upon the wood, and thus firmly impels it against the driving roller, which is ribbed or fluted to give it the requisite degree of bite. The blocks k^1 are made to slide up and down in the before-mentioned slots, and immediately above them are placed powerful spiral springs, shown at *m* in figure 5; screws, *n*, passing through caps bolted to the frame *a* immediately over the slots may be turned down upon these springs, and thus give the necessary degree of pressure to the upper roller, allowing at the same time sufficient elasticity for pieces of wood of unequal thickness to be carried through the machine. I shall not in this place more minutely describe this contrivance, as a similar one is shown more clearly and to a larger scale in the moulding and sash-bar machines, which will be hereafter described. I do not confine myself to the use of springs for the purpose of pressing down the roller, as weighted pressure levers may conveniently be substituted, and an arrangement of this sort is shown in figure 4 at m^1. The wood having passed between these rollers and between the first pair of guides *b* and *d*, already described, will come in contact with the tools, which will cut the broad surface of the wood perfectly flat and parallel. Before describing these cutters, however, I must state that the first of the upper tables or cross pieces

d, already mentioned, is of a somewhat different form to the rest, and is rather a block on which a powerful spring guide is attached than a guide shelf. The drawing figure 4 shows the shape of this block; *o* is a powerful flat spring screwed on to it. This presses upon the wood and keeps it from springing whilst under the operation of the cutters or planes *p* and p^1. In the main standards *a* will be other slots or openings, *q*, in these will be fixed bearings blocks, q^1, in and between which will work one of the circular planes. This plane *p* operates upon the lower surface of the wood whilst the upper surface can at the same time be levelled by a similar tool. This second tool or plane p^1 works also in and between blocks, q^2, which slide in the already-mentioned slots *q*. They may be lowered or elevated at pleasure, so as to take in and properly level the required thickness of wood. This is effected by a similar contrivance to that already described for elevating or depressing the guides *d*, the chief difference being that, instead of turning the screws as in the former case, they are fixed into the top of the blocks, and ascend and descend with them. The bevel wheels are attached to and form part of nuts, which, being turned and held in collars, cause the screws, and consequently the blocks, to ascend and descend. The arrangement is completely shown in figure 1.

The tools I use in this machine for planing the surfaces of the wood I will now describe. They will in all cases consist of a shaft on which will be arranged cutters of various forms; those I particularly claim as my invention, I will now describe, stating, however, that I do not confine myself to those I shall now explain, but propose to use any other revolving cutters that may be found to answer the purpose; the modes, however, that I do especially claim as my invention consist, first, of a shaft, P, better seen in figures 9 and 10, where a portion of the plane and cutter is drawn to an enlarged scale; this cutter consists of a series of elliptical saws, 6, placed askew on the shaft *p*, having interposed between them washers, 7. The object of this arrangement is to obtain at the same time a nearly constant cut, and to allow sufficient space for the cuttings. In order to prevent the tool from clagging, to prevent the saws from turning when at work upon the shaft P, a feather, 8, is inserted in the shaft and correspond-

ing notches made in the saws and washers. The angle at which the elliptical saws must be set will be such an one that the cutting edges may all form portions of the surface of the same cylinder. It will be obvious to any workman, that, by adding to the number of saws and washers, any required width may be given to this tool. A portion of another kind of plane is shown in figures 7 and 8 on the same sheet. In this plane, cutters similar to ordinary plane irons are used; these cutters may be either in a single piece for each length of the plane, or in separate pieces, as shown in the drawing. The shaft is made of cast iron, and will be so formed that the edges of the projecting parts of it may serve the purpose of covers or double irons, and may also form a gauge by which to set the cutting edges at their proper distances from the centre. Figure 7 is an end view, and figure 8 a front view, of a portion of this plane, the length of which will, of course, be regulated by the machine for which it is intended; 1 is the cast-iron shaft and 2 the cutters which are screwed on to the iron. I consider it unnecessary to describe any other forms of cutters, as it is evident that they may be considerably varied, without, however, altering the principle or the other arrangements adopted in the machine. After the wood has passed through the planes it will again be conveyed between a pair of guides, *b*, *d*, and after passing them will come in contact with the edge-planing cutters, and if needed the moulding planes. These planes and their shaft are shown at *s* and *s*' in the drawings of the machine. One of these widthening planes is shown to a larger scale in figures 11, 12 and 13, sheet 2; it consists of a circular disc or wheel, 4, to the periphery of which is attached, by screws or otherwise, a series of cutters, 6, of an annular or other convenient form, acting as gouges, and in their rotation levelling the part of the wood that is brought in contact with them. Nearer to the centre and somewhat ranker, is a flat cutting tool, 7, which will take off a fine shaving and finish the work. This plane is similar to the one already described in the other planing machine. Both the planes or cutter wheels used for the two edges of the boards are upon the same shaft; one may be a fixture, the other should be movable in order that it may be adjusted to any width of board. In figures 11, 12 and 13, already referred to, the mode of

effecting this is shown, in side view at figure 11, in section at figure 12, and in front view at figure 13, where 3 is the main shaft, down which is a slit or groove, 8; a feather, 9, is inserted in the hole through the centre of the wheel, which can slip up and down the grooves, but prevent effectually the wheel itself from turning upon the shaft; when properly placed upon the shaft, the plane may be fixed by the binding screw 5. In addition to those planes, another for cutting the mouldings of skirtings or other similar objects may be fitted to the shaft *s*, and may be made to slide and be fixed where needed by a contrivance similar to that just described. A tool of this kind is shown in figures 9 and 10, sheet 7. Figure 10 is the side view, and figure 9 the top view of this plane; these figures are to the full size. The principle adopted in this tool is the same as the second kind of surfacing plane before described (say figures 7 and 8, sheet 2), *videlicet*, that the tool block or carriage is so formed as to serve the purpose of a double iron or cover, being made to the shape of the cutter of the intended moulding. In these figures, 10 is the cutter block of cast iron or other suitable material; 11, cutters set at an angle which form the moulding; 12, the feather groove; 13, binding screws to fix the block where required. Other sorts of cutters may be substituted for the one here shown, as, for instance, one similar to figure 13 on the same sheet, but I prefer that described. The wood after passing between these cutters will again go through a pair of guides, *b*, *d*, and thence out of the machine. It is intended in practice that one piece of wood shall tail another through, but if deemed advisable, another pair of rollers may be placed beyond these guides to lay hold of the wood and draw it out, as is done in the first machine described. Motion is conveyed from any first mover through endless straps to the drums or pulleys *t*, fixed into the shafts of the different planes, and from the shaft of the lower surfacing plane, by means of a double endless screw, motion is given to the driving roller. On the shaft P is a screw which turns the wheel *v* and shaft *w*, and on the shaft *w* is another screw which turns the driving roller *l* through the wheel *x* fixed upon its shaft. It will be obvious to any workman, that by a proper selection of the number of teeth for his wheels, any required velocity my be given

to the driving roller; about three sixteenths in advance for each revolution of the cutter will answer very well for this machine. The cutter p and p^1 may, if thought advisable, be set obliquely across the machine, instead of being at right angles to the length of the wood. The scale to which this machine is drawn is one and a half inch to the foot.

I shall now describe the machinery for running out mouldings, picture frames, small architraves and other articles.

Figures No. 1, 2, 3, 4, 5 and 6, sheet No. 3, exhibit, respectively, figure 1, the top view; figure 2, the transverse section at b, b; figure 3, the longitudinal section; figure 4, the transverse section at a, a; figure 5, the longitudinal elevation; figure 6, the end view of the machine. W shows the wood, which is of a triangular form, passing through the machine in the direction of the arrows; at the part W^1 it is shown already formed by the cutters into the required shape; a shows the sides or framework of the machine. This framework is firmly bolted to a table or bench, or other convenient support by the bolts b, and to the cross piece c by the screwed bolts d; this piece c, it will be perceived, has a portion running nearly the whole length of the machine, and two transverse portions, one at each end, against which the side frames a are bolted, and on each of which is a slide, c^1, similar to that which forms the bed on which the tool holder in an ordinary slide rest moves; the piece c, c^1, as well as the frames a, I prefer being of cast iron. Upon each of these slides, c^1, will be fitted, by means of the strips of gun metal e, the sliding pieces f, which together will be capable of moving backwards and forward upon the slides c^1, which they will be made to do by means of nuts, g, attached to their lower surfaces, and screws, h, as the slide of a slide rest is moved. As it will be required that these two sliding pieces, which, with their strips, I prefer being of gun metal, should always move over equal spaces whensoever their position is altered, I attach to one end of the screws h, bevel wheels, i, which gear into other bevel wheels, i^1, fixed on a shaft, j; this shaft is supported by and turns in the gun-metal hearings k, and is worked by the handle l. By turning this handle motion will be communicated simultaneously to the sliding pieces f, and through

them, as will presently be seen, to the piece *m*. This piece, which is of cast iron, has, in section, the form of a right angle in its inner side, and is the bed along which the strip of wood W, intended to be moulded, will travel. The angle that would be formed by its outer sides, if prolonged, it will be seen by the section in figure 4, is rounded off and becomes curved, being a portion of the surface of a cylinder, the axis of which is the internal angular line. By this contrivance, the piece *m* may be supported in almost all its lengths by *c*, and at the same time has the power of being turned round a quarter of a circle upon the internal angular line which forms its axis. This piece *m* is supported at its ends, and turns in semi-circular bearings on the two sliding pieces *e*, *f*. These ends are portions of hollow cylinders, as is shown by the dotted lines m^1, figure 6, and they are held down securely to *e*, *f* by semi-cylindrical pins which are attached to the pieces f^1, and screwed with them to *f*. By this arrangement, the piece *m* can be made to turn on its axis without in any way impeding the passage of the triangular strips of wood, and it may be moved laterally in a direction parallel to the sides of the frame by the simultaneous movement of its bearings *f*. The object of this movement is to enable the workman to set the bed *m*, and consequently the wood which passes over it, in a proper position with regard to the roller and cutters. By means of the milled heads of the conically pointed screws *n*, which can be turned into corresponding holes (best shown in figure 6) in the sectors which are attached to the pieces *m*, this piece can be fixed at the angle required for work; in this piece *m*, the figure of which will be understood by consulting the various drawings, near the end where the wood enters are two rollers, *o*, the axis of which are perpendicular to the axis and parallel to the inner faces of the piece *m*; they project a little within these faces, so as to form friction rollers over which the wood will run when driven forward, as it will be by the grooved roller *p*; this roller is pressed down firmly, and with any required degree of power upon the wood, by means of the screws *q*, which work in caps q^1, firmly fixed on to the frame *a*; above the ends of the roller *p* are bearing blocks, *r*, between which the roller will turn; these blocks are fitted so as to be able to slide up and down

the slot or groove shown in the frames a; into them are screwed stout wires or rods, r^1, around which are coiled powerful spiral springs, s; these wires go through the screws q, which are bored for that purpose. It will now be evident, that by turning down the screws q, they will act upon the spiral springs or their caps, and thus compress them strongly, and force down the bearing blocks r, all being kept steady by the rod or wire r^1 which passes through the screw; by turning the roller in the direction of the arrow, it is evident that the wood will be carried forward into the machine along the bed m. Immediately after passing the roller, the wood will come in contact with the plane irons u, which are inserted through openings in the sides of the piece m, and are screwed in place by the caps and screws v; after passing these cutters, which will plane its two under sides, the wood will pass under a powerful flat spring, intended to press it firmly on to the bed m, and hold it steady whilst operated on by the revolving moulding cutters y, which will reduce it nearly to the form required; these cutters are shown to the full size in figures 3 and 4, sheet 7, where 8 shows the cutters; 9, the cutter frames of gun metal; 10, the shaft; 11, the screws that secure the cutters to the frame; 12, washers. The dotted lines 13 show the manner in which the cutters are formed underneath, in order to get proper cutting edges; these cutters are screwed upon curves, which are portions of a circle of equal radius to that with which the under side of the cutters is struck, but which are eccentric to the circle of motion. The nature of these curves will be instantly seen by consulting the drawing; their use is to retire the back part of the moulding iron sufficiently for it not to be pressed upon by the wood whilst making its cut, which it must necessarily be in this machine if the outside of the cutter were concentric with the circle of motion, as the wood is constantly and regularly advanced by the roller p; moreover, when the cutters are ground, which they will be on the face shown by the dotted lines 13, they can be advanced up the incline of the eccentric, and fixed where needed, by the screws 11; the slots 14 are made for that purpose. Thus the cutting edges may always be adjusted to the same places, when a large portion of the tools has been ground away, insuring

thereby similar mouldings to the last. Figure 8, sheet 7, is a top view of one of the moulding irons. I particularly claim this arrangement of cutters as my invention, for the purposes mentioned, but I do not confine myself to them, as many varieties can be introduced; for instance, those shown at figures 5 and 6, 13 and 14 on the same sheet, and which are elsewhere described, may easily be applied. After passing these cutters, the wood will enter the guides z of the fixed planes z^1, and passing through them will have a shaving taken off from its moulded side, which will complete it; the plane z^1 will be screwed on to the block z^2, which will be screwed on to the framework a; as I shall fully describe these planes in speaking of the sash-bar machine, it will be unnecessary to enter into further details here. Upon the shaft of the revolving cutter frame is fixed a driving pulley, 1, which gives motion to the cutters by its connection with any first mover through an endless strap or chain at the other end of this shaft, which revolves between the points of the milled headed screws 2, which screws are screwed from unturning by binding screws, 3, and fly nuts, is formed a pinion, 4; this pinion gears into a spur wheel, 5, having on its shaft a pinion, 6, which gears with and drives the wheel y, firmly secured on to the shaft of the roller p. By means of this train of wheels, a slow motion is conveyed to the roller, whilst the cutters are revolving with a very rapid one, and the relative velocities may, of course, be regulated by altering the proportions of the size of the wheel and pinion of the train; different kinds of wood will require rather different velocities, and the relative velocities of the roller and cutter shaft will vary with the number of cutters and the diameter of the roller. I find in practice that $\frac{1}{20}$ of an inch is a good quantity to take off at each cut in soft woods, and $\frac{1}{40}$ inch, or less, in harder wood. As the roller, and consequently the wheel 7, will be elevated or depressed according to the thickness of the wood operated on, it became necessary to provide for the regular adjustment of the train of wheels, so that they might always be geared at the right pitch, to effect which the wheel and pinion 5 and 6 revolve on a spindle, 8, fixed into a movable arm, 9; this arm is composed of two pieces bolted together by the bolts 16; it revolves on circular bosses on the frame a, through

which bosses the mill-headed screws 2 pass, and it may be duly elevated and depressed by the screw 11. Although I describe the wood in this and the sash-bar machine as being finished by fixed plane irons, after having been operated upon by the circular cutters, and although I claim this arrangement, generally, for the purpose of making moulded articles, nevertheless, in some cases, it will be found advisable to finish at once from the circular cutters. In such cases, it will be necessary, where the fixed planes are shown in the drawing, to substitute powerful springs, similar to those shown in the sash-bar machine for the double purpose of preventing the wood from springing up to the cutters, and by its frictional resistance to prevent the cutters from dragging the wood through, when it has escaped from under the driving roller. It is intended that one piece of wood should tail that preceding it through the machine; nevertheless, if considered advisable, another pair of rollers could be added beyond the planes for that purpose. This machine is drawn to $\frac{1}{3}$ the real size.

The next portion of machinery to be explained is for running out sash bars and rails, sash stiles and other similar work. The machine I shall now describe is shown in the drawing adapted to the formation of sash bars, but it will be at once palpable to a workman who has made himself master of its arrangements, that by altering the cutters and guides it may be adapted to other objects. In sheet 4, fig. 1 shows a transverse section at *b*, *b'*; fig. 2, a longitudinal section; fig. 3, a front view; fig. 4, a top view; fig. 5, a side view; fig. 6, a section at *a*, *a*, *a* of this machine. W shows the wood passing through in the direction of the arrows, W' being a portion already formed to the requisite shape passing out of the machine; *a*, is the framework of the machine; it is in two portions, which are tied together by the square bolts and nuts *b*, and by the cross pieces *c*; they are also bolted to the floor at *d*; the cross pieces *c* form the tables over which the wood will travel, and are the foundation of a system of guides or gauges through which the wood has to pass; the wood being pushed through one of these guides, is introduced between a pair of rollers which propel it through another gauge, and then against circular cutters which act on its upper and lower faces;

then it goes through another guide, and against fixed plane irons which take off a shaving and finish the work. On each of the cross pieces *c* is cast two blocks, *c'*, at right angles to its length; to the inside faces of these cross blocks are fixed on one, which in the drawings is to the right hand, a small block or strip of brass, *d*, the thickness of which will be regulated by the width of wood to be operated on, and on the inside of the opposite one a spring, *e*, which serves to keep the wood well pressed against it. To the top of the cast-iron cross blocks is also screwed a broad and powerful spring, *f*, by means of screws, *f'*; these screws may be tightened or loosened so as to give the spring the necessary degree of pressure on the wood; the wood is thus firmly guided, being pressed on two sides by powerful springs against the other two sides which form, of course, a solid resistance. It is hardly necessary to say that the tops of the cross tables and the sides of the brass blocks are so arranged with regard to each other that the wood may press fairly on all of them; *g* are the rollers which carry forward the wood; they have their bearings in blocks, the lower pair of which is fixed, the upper movable. The lower roller is therefore fixed, and the upper is movable, and serves to press firmly upon the wood in a manner and with arrangements perfectly similar to those described for a like purpose in the moulding machine; it is therefore unnecessary here to recapitulate. The wood is now carried by the roller through the second guide to the revolving cutters, which operate upon it both at top and bottom, and reduce it nearly to the form of a perfect sash bar; *h* are the revolving cutters. One of them is shown to an enlarged scale in figs. 5 and 6, sheet 7, fig. 5, being the front view, and fig. 6 the side view; 8 is the shaft of the cutter frame; 9 the cutter frame; 10 the cutters, and 11 the screws that hold them in place. The cutter frame is so formed as to operate as a double iron, preventing the tools from making too rank a cut, and thus keeping the work smooth. If thought more advisable, however, the cutter frames need not be wrought to the shape of the moulding, in order to act in the way I have described, but instead a double iron may be screwed on to it, the capping iron being between the cutters and the cutter frame. This description of cutter I par-

ticularly claim as my invention; nevertheless I do not confine myself solely to the use of this cutter, as cutters similar to those shown in figs. 3 and 4, and 13 and 14 in the same sheet may conveniently be used, or other sorts of cutters may be applied in the machine. After passing these cutters the wood will again traverse one of the guides, and then come in contact with moulding planes, *i*, fixed on to the blocks *j*. These blocks *j* are fixed on to the framework *a* by the screws *k*. In the drawings of the machine I have shown these plane irons naked, the better to make their operations understood; shavings are shown in the section coming off from the irons. In sheet No. 7, figs. 1, 2 and 7, I have shown one of these planing blocks properly fitted with guides and double irons to an enlarged scale; 12 is a cast-iron block, the form of which is perfectly shown in the various drawings; fig. 1 being a front view, fig. 2 being a top view, and fig. 3 a section. I have shown a portion of the plane complete, another portion with the guides removed, and a third with the planing block quite bare; 13 shows one of the gun-metal guides. The guide is formed into the shape of the sash bar as it leaves the revolving cutters, and serves to steady the work, and prevent the planes from cutting too rank or leading into the grain of the wood; they are fastened by screws, 14, to the block 12, and may be changed for others when the moulding irons are changed; 15 and 16 show the double irons, 15 being the cover, and 16 the cutter; 17 are the screws that fasten the two irons together; 18 the screw that holds them together on the block. In the drawing of the machine I have shown two such planing blocks, one behind the other, the first being intended to remove a coarse shaving, and the second a fine one; however, one only may be used if thought advisable, and in some cases it may be considered sufficient to leave the work from the circular cutters. The upper cutter shaft will be made to revolve by an endless band coming from any first mover over the pulley *l*; on this shaft is a wheel, *m*, which gears into a similar one, *m'*, on the shaft of the lower cutter; thus when the upper cutter shaft is turned the other will revolve with equal rapidity. On the end of this lower shaft is a pinion, *n*, which gears into a wheel, *o*, on the shaft of which, but on the other side of the frame, is a pinion, *p*, which turns the wheel

q, affixed to the shaft of the lower roller; this train of wheels is similar to that used in the moulding machine; of course the number of teeth in these wheels and pinions will regulate the velocity of the roller as compared with the cutters. I find $\frac{1}{20}$ inch a good average quantity for each cut; r are wheels which connect the rollers g together. The cutter shafts turn on the points of screws, s, which go through the frame of the machine. The machine is drawn to half the real size.

The next machine I have to describe is for the purpose of tenoning the ends of door and shutter rails, and other kinds of wooden framing. The drawings figs. 1, 2, 3 and 4, sheet No. 5, show, respectively, fig. 1, a front elevation; fig. 2, a side elevation, with the sliding table hereafter described removed; fig. 3, a top view, and fig. 4 a section at a, a of this machine; a are standards of cast iron or other suitable material, on which are firmly screwed the two parallel rails b. The upper edges of them are formed triangularly, and fit into corresponding grooves on the under side of the bed or table c; so as to enable the said bed to slide backwards and forwards upon them. One of the edges of the table d, at right angles with the grooves, is raised a little above the general surface (say about an inch), forming a ridge against which the piece of wood to be tenoned is held; e are two sliding blocks which may be shifted and fixed by means of the screws and nuts f in any required position; g is also a sliding piece which may be set in different positions, and fixed by means of the screwed nuts h; the use of these slides will be hereafter described; i is a strong standard or support of cast iron or other suitable material, firmly bolted to the floor by means of the bolts j. The holes through which these bolts pass are made oblong in order to allow the standard, when necessary, to be adjusted into place. This standard supports at right angles two brackets, k, somewhat similar to the head of a lathe; they are secured by bolts or screws permanently into place against the side of the upright i; the upper of these heads has a mandrel and pulley, l. Both ends of this mandrel work in bearings, and the mandrel itself is hollow and tapped in the inside, in order to receive a long screw in which goes through it from the top, and forms a centre point on

the bottom side. The lower bracket *k* is fitted with a pointed screw and fly nut, *n*, and between the point of this and the point of the above-mentioned screw *m* will work a spindle, *o*, which is fitted with two circular saws, *p*, *p*, separated to the required distance by washers, and held by a fly nut. This spindle will be turned by a driver fixed on to the mandrel *l*, and may be adjusted to the required height, by elevating or depressing the points of the screws *m*, *n*; *q* is also a standard or support of cast iron or other suitable material, on which is fixed two slides, *r*, on which move the plates or heads *s*, which on their under side have nuts and sliding strips, and are advanced or withdrawn to and from each other by the screws and handles *t*, as in an ordinary sliding rest. On the upper slide of each plate are two arms or brackets which support a mandrel and pulley, *u*, to the outer side of each of which a circular saw, *v*, is screwed, which together form the cross-cutting saws of the tenons; *w* is also a standard, between which and the standard *q* are the rollers *x* and a drum, *y*, on the shaft of which, outside of the standard *w*, are attached the fast and loose driving pulleys *z*. This explanation of the parts of the machine I think will be sufficient for any workman to comprehend its construction and arrangement. I will now describe it when at work. The first mover in the machine is the drum *y*, which is driven from without by a band on the fast pulley *z*, which band being thrown into the loose pulley *s*, the movement of the machinery ceases. It is easy to trace in the drawings the direction of the driving guts, which communicate motion from the drum to the pulleys *l* and mandrel *u*. I shall therefore now suppose that by their means all the saws are revolving, and shall proceed to show how the required tenons will be formed. The workman having selected the pieces of wood on which the tenon or tenons are to be formed, will, in the first instance, fix the sliding blocks *e* so that they will just admit between them and the ridge *d* the piece of wood W. The slide *g*, which is bent over at a right angle at its end, serves as a gauge for the length of the required tenons, and must be adjusted accordingly. The saws *p* must be separated from each other by a washer equal to the thickness of the intended tenon, and must be adjusted to the required height by the screws *m* and *n*. The cross-

cutting saws must also be placed at the right distance from each other by means of the adjusting screws and handles *t*. All is now ready; the workman having adjusted a piece of wood against the ridge *d*, and against the square corner of the gauge *g*, will place his hand upon it, and holding it steady, push the table forward along the rails; in doing this the end of the wood will first come in contact with the saws *p*, which will divide that portion into three slabs, the top and bottom one of which, next coming in contact with the cross-cutting saws, will be separated, and thus make the required tenon; the table being drawn back, the wood is turned, end for end, if a tenon of the same dimensions is there wanted, or is replaced by another piece, and the same operation repeated as long as tenons of the size to which the machine is set may happen to be wanted. By using, in the place of the saws *v*, cutters similar to the one shown at fig. 11, sheet 6, or of the form of either of the mortising cutters in the same sheet, or indeed any sort of broad circular cutters, the saws and frame *i*, *p* may be altogether dispensed with, or by using very thick saws as cutters instead of *p*, the portions *w* and *q*, and saws *v*, will not be required. This machine is drawn to the scale of 1½ inch to the foot. The next machine I shall explain is for the purpose of cutting out triangular strips of wood, intended to be afterwards converted into mouldings or other similar objects. In sheet No. 5, fig. 5 shows the front view or the view of the end of the machine at which the wood to be cut will enter. Fig. 6 is a longitudinal section; fig. 7 is a back view of the machine, or of the end at which the bisected strips of wood leave it; fig. 8 is a top view; *a* is the principal frame-work of the machine. It is screwed firmly to a bench at the bottom, and is also held together at the top by the screwed rods and nuts *b*, and at one end by the cross piece of framing *c*, by which it will be perceived by the drawing is formed with a large circular opening, having a narrow concentric flange, *c'*, formed upon it. A ring *d* is fitted within this flange upon the face of *c*; it may be turned and fixed in any required position by the binding screws *e*, *e*, which work in segmental grooves cut through the ring. The proper motion of this ring is similar to that commonly employed between the two slides of the slide rest in order to allow the tool holder to be turned

to any required angle. Parallel to the plane of this ring, and with their top surfaces ranging in the same direction, but slightly below the horizontal plane which passes through its centre, are fixed four standards or supports, *f*, on which are screwed the pieces *g*. These pieces *g* formed the bed along which the wood intended to be cut will slide; they are formed, on the side on which the wood moves, into the shape of a rectangle, and the line where the two sides meet which form the rectangle is the prolonged axis of the above-mentioned ring *d*; one of its sides is in the vertical, the other is the horizontal plane. It will be perceived that there are two pieces, *g*, having a space between them where a roller works; the top edge of this roller is sufficiently above the surface of the tables *g* to bite and propel the wood, which is kept firmly down upon it by the pressure roller *i*, the degree of whose pressure is regulated by screws, *j*, and spiral springs, *k*, similar to those of the moulding and other machines; *l* is a spiral carrying a circular saw, *m*, and a pulley, *n*. This spindle has cups at its end, and revolves upon the points of the screws *o*, *o*, which go through blocks on the outer face of the circular plate *d*. The saw goes through a slot, as shown in dotted lines at *o'* in fig. 7, and at *o'*, fig. 6, in the angle of the rectangular table *g*, and its plane will bisect that rectangle in any required proportions, by turning and then fixing the circular ring *d*; *p* are binding screws; *q* is a spindle in which is a pulley; at its outer extremity is a pinion, *r*, which gears into the wheel *s*, on the shaft of which is the pinion *t*, which gears into the wheel *u*, which is secured on to the shaft of the driving roller. By means of this train of wheels, and the proportion given to them, the driving roller may be made to advance the wood, with any required degree of velocity, up to the saw; *v* is a support to the wheel and pinion *s*. W is the wood operated upon going through the machine in the direction of the arrows; *x* is a shifting block which may be removed to any required distance from the vertical face of the table *g*, and serves as a gauge to the wood. It is fixed by means of the screws *y* to any distance that the thickness of the wood may make necessary; Z are couplings which hold the spindle *q* in place. Motion is given to the circular saw in this machine by connecting it to any first mover by an endless gut pass-

ing over the pulley n, and to the driving roller by a similar gut passing over the pulley of the shaft q. The velocity with which the wood should be advanced by the rollers is the same that would be found most convenient with other circular saws. To work this machine, all that is needed is to introduce a strip of wood, of the dimensions required to make two of the triangular strips that may be wanted, between the rollers, after having adjusted the ring carriage of the saw, so that it may cut in the proper angle, and as one strip passes through to follow it up by another. This machine is drawn to half the real size.

The next machine I shall describe is for mortising the stiles of doors, shutters and other similar pieces of framing. In sheet No. 6, fig. 1 is an end view; fig. 2, a front view; fig. 3, a transverse section at a, a; fig. 4, a top view; fig. 5, a view of the back portion of this machine; a, a are standards of cast iron, firmly bolted to the floor; these standards, which are four in number, support two double V beds, b, similar to the beds of a lathe. These beds are screwed to the standards and adjusted to a perfect level. On the under side of a cast-iron table, c, are grooves fitted on the V's of the beds, so as to allow the table to be slid backwards and forwards on them. To insure regularity and parallelism in the motion of this table, nuts are affixed to its under side between the 2 V's of each bed, through which are introduced similar screws, d. By making an equal number of turns on these screws, it is evident that if the table is once properly placed on the beds, it will advance or recede steadily up and down them. To insure an equal number of turns being given at the same time to these screws, they have bevel wheels, e, attached to their outer ends, which gear into other bevel wheels, e', fixed on a shaft, f. This shaft, being supported in proper bearings screwed on the main standard, is worked by the handle g; by turning this handle the screws d will be turned, and the bed advanced or drawn back. It is upon this bed that the wood W, intended to be mortised, will be held, and by it will be carried forward to the cutters. I will now describe the mode by which the pieces of wood are held in place whilst under the operation of the cutters: h, h, are columns which are firmly bolted to the top of the sliding table, and which carry

cross pieces of metal, *i*, firmly secured to them. These pieces of metal serve to tie the columns, which are four in number, together, and to form the supports of portions of the machinery, which I will presently describe; *j* is a beam of cast iron, of the form shown in the drawing; at its two ends are attached nuts, through which screws, *k*, pass. These screws, by an arrangement perfectly similar to the one I have already described, are made to turn equal quantities in equal times, and thus to raise the beam any distance that may be required in a direction perpendicular to the face of the table. The mode of turning the pair of screws *k* is precisely similar to that already described for working the pair *d*, so that it will be sufficient to consult the drawing to understand the arrangement. It is by means of the handle *l*, that beam *g'* is raised and lowered; upon the table *c* is a small ledge or straight edge, *m*; the piece of wood to be worked is placed on the inside of this ledge, and close up to it, and a pair of dogs are made to clip it at its ends; these dogs are worked by a right and left-handed screw; *n*, *n* are the dogs, and *o* the screw. The dogs are just seen at the ends of the wood W in fig. 2, and one of them with a section of the screw in fig. 3. The screw *o* is plainly seen through the open work of the cast-iron table *c*; it is supported at its ends from the bottom of the cast-iron table, and is turned by the handle *p*. By working this handle, the dogs may be made to approach towards or recede from each other, and thus to clip any length of wood that can be put into the machine. The workman having adjusted these dogs to a proper distance from each other, if he have a series of pieces of wood of the same length to work upon, will, when one is finished, remove it, and place another between the dogs and against the rail *m*; he will then press down the beam *j* tightly on to the wood, and proceed to advance it to the cutters, the operation and arrangements of which I will now describe: *q* are standards of cast iron firmly bolted to the floor, and made to arrange in the same direction as the beds *b*, and arranged with regard to them and the table *c* as shown by the drawing; *r* is a bed of cast iron formed at its upper surface like the slide of a sliding rest, in order that heads or poppets may be fitted on to it, and be able to be moved along it. This bed is supported between the standards *q*, and

is set with its top face in a plane parallel with the top of the table c; its ends are accurately fitted into grooves or openings left in the standards q for that purpose, and are furnished with nuts, r', through which pass screws, s; these screws, by means of the handle t, the bevel wheels t^1, and the shaft t^2, can be turned equal quantities, in equal times, being altogether a movement similar to that which has twice before occurred in this machine. The position of the bearings of these parts will be immediately seen on consulting the drawings, more particularly fig. 5; u are poppets or heads fitted by means of sliding slips on to the bed r. They are capable of being moved along this bed. To do this a screw, v, is introduced into a trough, r', left for that purpose in the bed, and passes through all the poppets. Within these poppets nuts having a corresponding female screw are placed, so that by turning the screw v, the heads are made to move backwards and forwards on the bed; x is the handle which turns the screw. Each of these poppets has two mandrels and pulleys, similar to those of the head of a lathe, on the noses of which are screws to which cutter chucks may at pleasure be affixed.

In order to render the description I am about to give of these heads more intelligible, I will explain, in the first instance, the nature of the cutters and the modes of operation of the machine.

In figures 6 and 7, sheet 6, at 1 are shown two varieties of the cutter I use. It consists of a boring tool and a circular plane united, and acts in two distinct modes. The first portion of it bores a hole through the wood intended to be mortised, by the wood being forced against it whilst revolving, and the second by being forced laterally against the wood widens that hole, 1^a shows the boring portions; 1^b, the side cutting ones. The machine I am now describing being intended to cut simultaneously all the mortises required in the stile of a door, or other similar objects, it is evident that at least as many cutters will require to be set in motion as mortises are needed, and inasmuch as the different mortises will be of different lengths, that the cutters should be so arranged as to cut away unequal portions of wood in the same space of time. The width of the mortise will be regulated by the diameter of the tool employed, and its length by the quantity of space it will travel over

whilst cutting. The mode in which the machine operates is as follows: cutters having been screwed on to such of the mandrels of the poppets *u* as are intended to be brought into action, they are made to revolve rapidly by means of an endless band which passes over their pulleys. This is well seen in fig. 5. By means of the handle *t*, the bed *r* with its cutters is raised to the proper height for the required mortises; the piece of wood is then placed in its proper situation on the table *c*, and is clipped by the pressure beam *j*; the whole is then advanced by the handle *g* against the cutters, which thus bore circular holes through the wood. Each of these holes will form one end of a mortise. The wood is still further advanced by the handle *g* until the boring part of the tool projects through the wood, and the whole width of it can be operated on by the planing portion. The screw *v* is next turned by means of the handle *x*, which brings the wood in contact with the sharp edges of the cutter 1, at 1^b, by drawing or forcing along laterally the head *u*. When enough wood has thus been cleared away, the heads are returned to the point whence they started, the table is drawn back, and the mortised wood is replaced by another piece, and the operation repeated; any number of mortises may thus be cut simultaneously. It is to be observed, that the cutters I have just described apply only to thorough mortises, for bottomed mortises the boring part shown will be removed, and the end of the planing part formed so as to bore the hole.

I shall now describe the mode of advancing the cutter frames, unequal portions in equal times, and in fact explain more particularly the details of this portion of the invention. In sheet No. 6, figs. 6, 7, 8, 9 and 10 show, respectively, fig. 6, fig. 7, the two end views; fig. 8, the front view; fig. 9, the top view; fig. 10, the long section of one of the cutter poppets. In these figures, *r* is a portion of the bed, *u* is the poppet, and *v*, the screw that draws it along the bed; *r*, *s* are the gun-metal slips screwed on to the bottom of the heads, and which serve to keep them steady on the bed; 1 are the cutters; 2, the mandrels having pulleys; 3, 4 are the back centres and nuts of the mandrel. The pulley being turned by a gut or band, it will at once be seen will cause the cutter properly to

revolve. The remaining details of these poppets are connected with their movement up and down the bed, which I will now explain: it will be seen, on consulting the various drawings, that the screw *v* goes completely through the heads *u*, which are bored for that purpose. The hole in all parts is larger than the screw *v*. In fig. 10, from 5 to 6 it is made just large enough to clear the thread; from 6 to 7, of a sufficient size to admit the cylindrical nuts 9; and from 7 to 8 still larger, being tapped with a female screw, in which the hollow capstan-headed screw 10 will work. The cylindrical nut 9 is tapped with a corresponding thread to that of the screw *v*, and works upon it; on to this cylindrical nut a gun-metal wheel, 11, is attached which gears into a pinion, 12, supported on bearings on 13. This pinion may be prevented from turning when needed, by means of the binding screw 14; it will now be seen, that by turning the pinion 12, by a handle put on to the projecting square end 12, that the nut *g* will be turned on the screw V, through the converting wheel 11. Let us suppose the nut to be in the position shown in fig. 10, and that it is made to turn and travel along the screw V towards the capstan-headed screw 10; it will evidently turn freely until its end 7 comes in contact with the end of the screw 10. It can then only continue to revolve by forcing the head *u* altogether along the sliding bed *r*; by this means the head can be forced to any part of the bed where it may be wanted for the required mortise. If we now fix the pinion 12 by means of the binding screw 14, we can reverse this operation; for by turning the screw *v*, the nut 9 will, in the first instance, be made to travel along the screw until its end 6 comes in contact with *u*, and the screw can only be continued turning by forcing the head along the bed *r*, in the other direction. A person who has thoroughly observed the nature of these movements may now understand how the heads can be made to move over unequal spaces whilst cutting the sets of mortises in a door stile or other similar article. Let us suppose that in one head the screw 10 is turned close up against the end of *g*, the other end of which is against *u*; it is plain that by turning the screw *v* any number of times, the head will travel along the bed a quantity equal to the distance between the thread, multiplied by the number of turns,

always supposing the pinion 12 to be fixed. Now, if in another head the screw 10 is turned back any quantity (say one inch for example), the nut *g* will have to travel that distance before it will move the head; consequently the mortise made by this head in the same time will be one inch shorter than the other, and so, of course, in any other required proportion, by a proper adjustment of the hollow screw 10. It may now be seen, that after the heads are properly placed to commence the mortises, and the screws 10 in all the heads adjusted so as to give to each its due length, the operation of the machine will be as follows: the wood will be advanced with the table *c* against the revolving cutters, each of which will bore a hole through the wood. The handle *x* must be turned by the workman a sufficient number of times to give the proper length to the mortises, which are formed by the action of the revolving cutters on one side of the hole already made. The mortises being completed, the workman must turn the handle *x* back again the same number of times, and then draw back the table *e*; the wood may now be removed and replaced by another piece, and the operation repeated. The scale to which this machine is drawn is half inch to the foot.

Having now given a detailed description of the different parts of the said "new and improved machinery for sawing, planing, grooving, and otherwise preparing or working wood for certain purposes," I hereby claim as my invention generally, the arrangements and combinations of machinery shown in the drawings annexed, for the purpose of producing the results hereinbefore set forth, and particularly I claim, first, in the planing machine, sheet No. 1, the advancing of the boards or scantlings, by means of rollers, against cutters of any form, fixed upon face chucks or face wheels, when two or more surfaces of such boards or scantlings are acted upon by the cutting tools simultaneously. Secondly, I claim the application of revolving moulding cutters, to form mouldings or boards at the same time that they are being planed. Thirdly, I claim the tonguing, grooving and moulding saws and cutters, marked figures 6, 7, 9 and 10, sheet No. 1, and figures 5, 6, 8, 9 and 10, sheet No. 7. Fourthly, I claim the application of the fixed plane irons, shown at

figure 2, sheet No. 3, to finish moulded work which has been prepared by revolving cutters. Fifthly, I claim the two sorts of planes described in figs. 7, 8, 9 and 10, sheet No. 2, and also the using of covers, to the cutters or double irons.

And such, my invention, being, to the best of my knowledge and belief, entirely new and never before used within that part of her said majesty's United Kingdom of Great Britian and Ireland called England, her Dominion of Wales, or town of Berwick-upon Tweed, or in any of her majesty's colonies and plantations abroard, I hereby declare this to be my specification of the same; and that I do verily believe this, my said specification, doth comply in all respects fully, and without reserve or disguise, with the proviso in the said hereinbefore in part recited letters patent contained; wherefore I do hereby claim to maintain exclusive right and privilege to my said invention.

In witness whereof I, the said William Hickling Burnett, have hereunto set my hand and seal, the eighth day of July in the year of our Lord one thousand eight hundred and thirty-nine.

WM. H. [L.S.] BURNETT.

And be it remembered, that on the eighth day of July in the year of our Lord 1839, the aforesaid William Hickling Burnett come before our said Lady, the Queen, in her chancery, and acknowledged the specification aforesaid and all and everything therein contained and specified, in form above written. And also the specification aforesaid was stamped according to the tenor of the statute made for that purpose.

Enrolled the eighth day of July in the year of our Lord one thousand eight hundred and thirty-nine.

Ex'd.— L.P.H.

DUCKWORTH.

DEFENDANT'S EXHIBIT Ac.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE SPECIFICATION IN THE MATTER OF THE APPLICATION OF JOSEPH E. ANDREWS, FILED JULY 27, 1846.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy, from the files of this office, of the specification and drawing in the matter of the application of Joseph E. Andrews, filed July 27, 1846, for planing machines.

In testimony whereof I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this ninth day of February in the year [SEAL] of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth.

ELLIS SPEAR.
Acting Commissioner.

To all whom it may concern:

Be it known that I, Joseph E. Andrews, of the city of Boston and State of Massachusetts, have made a new and useful improvement in the manner of constructing a machine for the planing of boards, and I do hereby declare that the following is a full and exact description thereof.

My improvement consists principally in the manner in which I construct the revolving carriage or platform, upon which the boards to be planed are sustained, and by which they are carried forward under the revolving plane irons or cutters. This revolving carriage

or platform is sustained upon two revolving circular tables, the faces of which are horizontal, and upon rebates formed in the outer and upper rims of the frame; just above these tables and rebates are situated the ends of a series of lags or slats, upon which the boards to be planed are to rest.

These lags or slats are carried round by means of a revolving chain which passes round and is supported on the peripheries of the revolving tables, there being projecting ledges on the face of each link of the chain, that retain the lags in place laterally. The frame of the machine has parallel sides and circular ends, and is constructed for the planing of two boards at the same time. The planing is effected by means of revolving cutters in a manner common to many other machines. To hold the board down on the platform, I employ pressure bars on each side of the revolving cutters, said pressure bars being forced down upon the board by means of spiral or other springs; these pressure bars do not revolve, and I have, in practice, found them to operate better than the pressure rollers. In the accompanying drawings, fig. 1 is a top view of the machine, fig. 2 is a view of the under side of it, and fig. 6 is a longitudinal vertical section from end to end thereof, through its middle. The revolving tables are shown at *e*, *e*, figs. 1, 2 and 6. Their shafts are seen at *f*, *f*, fig. 6. These are made fast to the tables at their upper ends, where they run in collars, *h*, *h*, fig. 6, their lower ends running in steps, *g*, *g*. The manner of driving them is shown in figs. 2 and 6. A is the driving shaft from which proceeds a band, B, that passes round whirls, *i*, and *i'*. The shaft of the whirl *i* carries a small cog wheel, F, that goes into the teeth F, F on the under side of the tables *e*, *e'*, fig. 6. The other revolving table is driven by the endless chain *b*, *b*, figs. 1 and 3, the latter figure showing a portion of the chain in perspective, with the lags or slats *l*, *l* removed from it. The chain consists of a series of links, *b*, *b*, hinged together by joint pins, *c*, *c*; they are flat on their upper and lower faces, as shown in fig. 4, which is an edge view of said chain. From the upper faces of these links projecting ledges, *k*, *k*, that are to receive the slats *l*, *l*, fig. 1, between them. The tables *e*, *e* have rebates at their edges, as seen at *o*, *o*, fig. 6; on these

DEFENDANT'S EXHIBIT Ac.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE SPECIFICATION IN THE MATTER OF THE APPLICATION OF JOSEPH E. ANDREWS, FILED JULY 27, 1846.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy, from the files of this office, of the specification and drawing in the matter of the application of Joseph E. Andrews, filed July 27, 1846, for planing machines.

In testimony whereof I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this ninth day of February in the year [SEAL] of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth.

ELLIS SPEAR.
Acting Commissioner.

To all whom it may concern:

Be it known that I, Joseph E. Andrews, of the city of Boston and State of Massachusetts, have made a new and useful improvement in the manner of constructing a machine for the planing of boards, and I do hereby declare that the following is a full and exact description thereof.

My improvement consists principally in the manner in which I construct the revolving carriage or platform, upon which the boards to be planed are sustained, and by which they are carried forward under the revolving plane irons or cutters. This revolving carriage

or platform is sustained upon two revolving circular tables, the faces of which are horizontal, and upon rebates formed in the outer and upper rims of the frame; just above these tables and rebates are situated the ends of a series of lags or slats, upon which the boards to be planed are to rest.

These lags or slats are carried round by means of a revolving chain which passes round and is supported on the peripheries of the revolving tables, there being projecting ledges on the face of each link of the chain, that retain the lags in place laterally. The frame of the machine has parallel sides and circular ends, and is constructed for the planing of two boards at the same time. The planing is effected by means of revolving cutters in a manner common to many other machines. To hold the board down on the platform, I employ pressure bars on each side of the revolving cutters, said pressure bars being forced down upon the board by means of spiral or other springs; these pressure bars do not revolve, and I have, in practice, found them to operate better than the pressure rollers. In the accompanying drawings, fig. 1 is a top view of the machine, fig. 2 is a view of the under side of it, and fig. 6 is a longitudinal vertical section from end to end thereof, through its middle. The revolving tables are shown at *e*, *e*, figs. 1, 2 and 6. Their shafts are seen at *f*, *f*, fig. 6. These are made fast to the tables at their upper ends, where they run in collars, *h*, *h*, fig. 6, their lower ends running in steps, *g*, *g*. The manner of driving them is shown in figs. 2 and 6. A is the driving shaft from which proceeds a band, B, that passes round whirls, *i*, and *i'*. The shaft of the whirl *i* carries a small cog wheel, F, that goes into the teeth F, F on the under side of the tables *e*, *e'*, fig. 6. The other revolving table is driven by the endless chain *b*, *b*, figs. 1 and 3, the latter figure showing a portion of the chain in perspective, with the lags or slats *l*, *l* removed from it. The chain consists of a series of links, *b*, *b*, hinged together by joint pins, *c*, *c*; they are flat on their upper and lower faces, as shown in fig. 4, which is an edge view of said chain. From the upper faces of these links projecting ledges, *k*, *k*, that are to receive the slats *l*, *l*, fig. 1, between them. The tables *e*, *e* have rebates at their edges, as seen at *o*, *o*, fig. 6; on these

rebates the inner edge of the endless chain rests for about half its width. The chain embraces the edge or peripheries of both tables, which tables I have made circular, although they may be polygonal, and the links be adapted thereto, but I have found the circular form sufficient to insure the revolution of the platform, one of these tables being adjusted so as to keep the chain sufficiently tort. The thickness of the links of the chain is such that their upper surfaces rise a little above the revolving tables. *m*, *m* is a rim that surrounds the revolving tables; the rim has a rebate, *n*, *n*, at its inner edge, the lower part of which is on the same level with the revolving tables. *c*, *c*, *c* is a guide plate, which is circular at its ends and straight at its sides, its end projecting over the revolving tables, of which they stand clear; its upper side is on the same level with the rim *m*, from which it is equi-distant at its sides and ends. The lags or slats *l*, *l* simply drop in between the ledges *k*, *k* of the links of the chain by which they are supported at or near their centres, their ends standing immediately above the tables *e*, *e*, and extending to within a short distance of the rim *m*, and of the edge of the guide-plate *c*, *c*, by which means they are checked from moving endwise; the lags are narrowed at their inner ends to enable them to pass round the circular ends of the machine; they may, if preferred, be attached to the links by a pin through their centres or otherwise. In figures 1 and 6, *a*, *a* are the planing wheel cutters, which may be driven by bands, G, G, passing round whirls, H, H and I, I. J, J are the pressure bars that may be forced down by spiral or other springs, *j*, *j*. To sustain the lags at their inner ends as they pass from one revolving table to the other, there is a ledge or rebate at *p*, *p*, figure 1, which is on the same level with the part O, O of the revolving tables. Under the foregoing arrangement the revolving platform operates without the use of railways or of truck wheels, the lags which sustain the boards resting on their centres loosely on the links of the endless chain, their ends moving with little or no friction, as they are merely checked, and do not in general bear upon the tables or ledges. In using this machine, two boards moving in reverse directions are planed at the same time, the boards being laid upon the lags or slats immediately above the endless chain.

Having thus fully described the nature of my improvement in the manner of constructing the revolving carriage or platform of a planing machine, what I claim therein as new, and desire to secure by letters patent, is the arranging and combining the respective parts of the said carriage or platform as set forth; that is to say, I claim, in combination, the lags or slats resting loosely at their centres on the links of an endless chain, said chain being formed and arranged in the manner described, and sustained on the rebated peripheries of two revolving tables; the lags or slats also being kept in place laterally by the ledges on the chain, and at their ends by the respective tables and rims, and the whole apparatus operating without the employment of railways or truck wheels, substantially in all respects in the manner set forth.

JOSEPH E. ANDREWS.

Witness,
BEN. AUSTIN LINCOLN,
GEORGE B. FOWLE.
Ex'd. — J.R.

DEFENDANT'S EXHIBIT Ab. — D.B.H., Special Examiner.

CERTIFIED COPY OF PETITION, OATH AND SPECIFICATION IN THE MATTER OF THE APPLICATION OF JOSEPH P. WOODBURY, FILED FEBRUARY 15, 1856.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

THE U.S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy, from the files of this office of the petition, oath, specification and drawing in the

matter of the application of Joseph P. Woodbury, filed February 15, 1856, for improvement in tonguing and grooving machines.

In testimony whereof I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-third day of February in [SEAL] the year of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth.

ELLIS SPEAR,
Acting Commissioner.

PETITION.

To the Commissioner of Patents:

The petition of Joseph P. Woodbury, of East Boston in the County of Suffolk and State of Massachusetts, respectfully represents, —

That your petitioner has invented certain improvements in machines for tonguing and grooving boards, which he verily have not been known or used prior to the invention thereof by your petitioner.

He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and conditions expressed in the Act of Congress in that case made and provided, he having paid thirty dollars into the treasury, and complied with the other provisions of said act; and hereby authorizes Samuel Cooper, of the city of Boston, to act as his attorney in presenting this application, altering or withdrawing the same as the case may require, and to receive the patent when granted.

JOSEPH P. WOODBURY.

OATH.

BOSTON, COUNTY OF SUFFOLK, }
STATE OF MASSACHUSETTS. }

On this seventh day of February, 1854, before the subscriber, a justice of the peace for said county, personally appeared the within-

named Joseph P. Woodbury, and made solemn oath that he verily believes himself to be the original and first inventor of the within-described improvements in tonguing and grooving machines, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

CAUSTEN BROWNE,
Justice of the Peace.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, of East Boston in the County of Suffolk and State of Massachusetts, have invented certain improvements in tonguing and grooving machines, of which the following is a full, clear and exact description, reference being had to the annexed drawings making part of this specification, in which fig. 1 is a plan of a planing machine with my improvements attached; fig. 2, a longitudinal vertical section through the same; fig. 3 is a section upon the line A, B of fig. 2; fig. 4 is a section upon the line A^1, B^1 of fig. 1, showing the operation of the feed rollers and their connection with the driving power.

Various methods have been devised for the purpose of tonguing and grooving boards, but they are all more or less liable to objections, most of them, whether revolving or stationary cutters be employed, failing to leave the tongues and grooves with smooth sides and with sharp unbroken angles.

The nature of my invention consists in cutting the sides of the tongues and grooves with thin fine-tooth saws, and subsequently removing the superfluous wood with stationary planes, the saw kerf, upon each side of both tongue and groove, leaving room for the stationary planes to operate and remove the surplus wood without jambing or choking, and without tearing or injuring the sides of the tongue or groove.

My invention also consists in a peculiar method of connecting the feed rollers with the driving power, by which the former are caused to press upon the lumber with a force that increases as the resistance offered to the lumber increases.

To enable others skilled in the art to make use of my invention, I will proceed to describe its nature, and the methods which I have adopted of carrying it out. X is the framework of the machine, the principal parts of which will be simply referred to, those which are immediately connected with my improvements being more particularly described. Z is a pulley upon the main driving shaft W, from which all the motions of the machine are derived. Y is a drum, set in motion by the band U, from a rigger upon the shaft W; the drum Y carries the bands O, O′ which actuate the saws, as will be hereafter more particularly explained. P is the bed upon which the lumber is laid to be fed into the machine. E, E′ are cutter stocks, which carry the saws and stationary plane irons. One of these stocks, E, is made fast to the machine, the other slides upon ways, F, and is moved towards and from the stationary stock by the screws G. These latter have cog wheels, M, upon their shafts, which engage with the bevel wheels I upon the shaft K, which latter is operated by the crank L, through the intermediate gearing D′, F′, as seen in fig. 1. *a* are ways which support the plank R, while it is being operated upon, and down upon which it is held by sp ing pressure bars, *b*, which bear upon its top surface, the p·sition of these latter being adjusted to the thickness of the plank by nuts, *d*, the springs *c* allowing them to yield, to accommodate themselves to the varying thickness of the lumber. *e*, *e′* are a series of plane irons, which dress the edges of the board in advance of the tonguing and grooving. *f*, *f′* are pairs of saws, the former for cutting the groove, the latter for cutting the tongue; these saws are attached to short vertical shafts, N, which are driven by bands, O, O′, as seen in fig. 2. *g* are a series of cutters, which operate upon the board after it has passed the saws *f*, and remove the surplus wood from each side of the tongue. *g′* are a series of cutters upon the opposite side, seen more distinctly in fig. 3, the object of which is to remove the wood from the groove, the sides of which have been formed by the saws *f′*.

It will be perceived that by this means the sides of both the tongue and the groove are left smooth and regular, and the stationary

plane irons are not necessarily brought in contact with them to wound or injure this smooth surface. G′ is a pinion upon the driving shaft W, which engages with the cog wheel H′; this latter is upon the shaft C¹, which carries the lower feed roller Q (fig. 4). I′ are cog wheels upon the same shaft, which gear with similar wheels, K′, upon the shaft N′; the wheels K′ also engage with the wheels L′ upon the shaft P′, and these latter gear into the cog wheels M upon the shaft C of the upper feed roller O″. The shaft N′ runs in the framework of the machine.

The shaft P′, with its cog wheels L′ is supported upon the arms U, and is allowed to vibrate around the shaft N′ as a centre. The shaft C of the upper feed roller U″ is carried by the arms A² and B², the former pivoting upon the shaft P′, the latter connected to the standard C² by the pivot *k*. It will thus be perceived, that as the lower feed roller revolves in one direction, the upper feed roller is caused to revolve in the contrary direction, at the same time that the two are allowed to separate from each other to accommodate the distance between them to the varying thicknesses of the stuff to be planed, without being thrown out of gear, and without the necessity of using the star gearing, heretofore employed for the purpose of connecting the upper and lower feed rollers. Owing to the motion allowed to the feed roller U″ around the pivot *k*, this feed roller will be caused to take a firmer hold upon the board whenever the latter meets with an increased resistance in its passage through the machine.

CLAIM.

What I claim as my invention and desire to secure by letters patent, in a machine for tonguing and grooving boards, is the combination of the circular saws *f*, *f′* with the stationary plane irons *g*, *g′*, arranged and operating in the manner substantially as described.

And I also claim the peculiar method of gearing the feed rollers Q″ Q with each other by means of the intermediate gear K′, L′, and the connecting arms U, A″, B″, whereby the force with which the

feed rollers gripe the plank, is made proportionate to the resistance which the latter encounters in being fed through the machine.

JOSEPH P. WOODBURY.

Witnesses,
JOHN S. CLOW,
SAM. COOPER.
Ex'd. — E.A.M.

DEFENDANT'S EXHIBIT Bz. — D.B.H., Special Examiner.

CERTIFIED COPY OF THE BILL IN EQUITY, FILED IN THE SUIT OF MASON *et al. v.* TALLMAN & BUCKLIN IN R.I. DISTRICT, FILED JUNE 19, 1850.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

To the Judges of the Circuit Court of the United States for the District of Rhode Island:

Nathan Mason, of the city of Providence in said district, planer of boards, William W. Woodworth, of Hyde Park in the Northern District of New York, as he is the administrator of William Woodworth, late of the city of New York, gentleman, deceased, and as he is the grantee of certain exclusive privileges, under and pursuant to an Act of Congress, as is hereafter fully set forth, James G. Wilson, of the city of Philadelphia, gentleman, and Richard Borden and Jefferson Borden, both of the town of Fall River and District of Massachusetts, bring this bill of complaint against *William Tallman & James C. Bucklin*, both of Providence aforesaid, planers.

And thereupon your orators complain and say, that William Woodworth above named, a citizen of the United States, being the true and original inventor of a new and useful machine, not known or

used before his application for letters patent, did apply to the Secretary of State of the United States for letters patent for such invention; and having fully in all respects complied with all the requisitions of the law in that behalf, and especially having made oath that he verily believed himself to be the true inventor and discoverer of such machine; and having also paid into the treasury of the United States the sum of thirty dollars, and delivered a receipt for the same, and presented to the Secretary of State of the United States a petition setting forth his desire to obtain an exclusive property in the said machine, and praying that letters patent might for that purpose be granted to him; and having also delivered and filed in the office of the said Secretary of State a written description of his said invention and discovery, and of the manner of using the same, and accompanied the same with drawings thereof, and written references, in such full, clear and exact terms as to distinguish the same from all other things before known, and so as to enable any other person skilled in the art with which the said invention is most nearly connected, to make and use the same, which said description was duly signed by the said William Woodworth, and attested by two witnesses; and the said Secretary of State did thereupon cause letters patent to be made out in the name of the United States of America, in due form of law in all respects, bearing date on the twenty-seventh day of December in the year of our Lord one thousand eight hundred and twenty-eight, whereby was granted to the said William Woodworth, his heirs, administrators or assigns, for the term of fourteen years from the date thereof, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said machine, which is entitled in the said letters patent, "A new and useful improvement in the method of planing, grooving, tonguing and cutting into mouldings, or either, plank, boards, or any other material, and for reducing the same to an equal width and thickness, and also for facing and dressing brick, and cutting mouldings on or facing metallic, mineral or other substance." And the said letters patent having been fully approved by the Attorney General and signed by John Quincy Adams, the President, and countersigned by Henry Clay, the Secretary of State of

the United States, and the said Secretary of State having caused the seal of the United States to be thereto affixed, and the same having been duly recorded, were issued and delivered unto the said William Woodworth; all which will more fully appear in and by the said letters patent, or a copy thereof duly certified by the Commissioner of Patents, to which, for greater certainty, your orators crave leave to refer.

And your orators further show unto your honor, that afterwards, on or about the ninth day of February in the year of our Lord eighteen hundred and thirty-nine, the said William Woodworth departed this life, at the city of New York aforesaid, where he was then resident; and thereupon, afterwards, on or about the fourteenth day of February in the year of our Lord eighteen hundred and thirty-nine, administration of the goods and estate, which were of the said William Woodworth at the time of his decease, was duly granted by the surrogate of the County of New York, having jurisdiction in the premises, unto your orator William W. Woodworth, son and one of the heirs of the said William Woodworth, deceased; and your orator William W. Woodworth thereupon took upon himself that trust.

And afterwards, on or about the twentieth day of July in the year of our Lord eighteen hundred and forty-two, your orator William W. Woodworth, in his said capacity, made application in writing to the Commissioner of Patents of the United States, setting forth that he desired an extension of the said letters patent and the grounds thereof; and having paid the sum of forty dollars to the credit of the treasury of the United States, and the said Commissioner having caused public notice of such application to be given according to law, and the Secretary of State and the Commissioner of Patents and the Solicitor of the Treasury of the United States having met, as the board designated by law for such purpose, on the first day of September in the year last aforesaid, at the Patent Office in Washington, being the time and place appointed for such meeting in the said public notice, did then and there proceed to hear and consider the said application, and on divers days and times, to which such hearing and consideration were duly continued by adjournment, did hear and consider the same, and such proceedings were then and there

had, that afterwards, on or about the sixteenth day of November in the year last aforesaid, the said board did adjudge and certify in writing, that, upon hearing of the said matter, it appeared to their full and entire satisfaction, having due regard to the public interest therein, that it is just and proper that the term of the said letters patent should be extended, by reason that the patentee, without neglect on his part, had failed to obtain for the use and sale of his invention a reasonable remuneration for the time, ingenuity and expense bestowed upon the same, and the introduction thereof into use; which said certificate having been duly signed by all the members of the board, the Commissioner of Patents did thereupon, according to law, renew and extend the said patent, by making a certificate of such extension therein for the term of seven years from and after the expiration of the said term of fourteen years, for which the said patent was originally granted; which last-mentioned certificate, together with the said certificate of the said board, having been duly entered of record, your orators crave leave to refer to duly certified copies thereof.

And your orators further show unto your honors, that on or about the second day of January in the year of our Lord one thousand eight hundred and forty-three, your orator William W. Woodworth, being satisfied of the truth of the facts stated and set forth in the disclaimer next hereinafter mentioned, did make disclaimer of all that part of the claim which is contained in the said letters patent which relates to the use of circular saws for reducing floor planks and other materials to a width, and the same having been duly filed and recorded in the Patent Office, your orators crave leave to refer to a duly certified copy thereof.

And your orators further show, that by an Act of Congress passed on the twenty-sixth day of February, eighteen hundred and forty-five, the said original patent was extended in favor of the said William W. Woodworth, for the term of seven years from and after the twenty-seventh day of December, eighteen hundred and forty-nine; and your orators crave leave to refer to the certificate of extension, or a duly certified copy thereof made by the Commissioner of Patents, under authority of the act aforesaid.

And your orators further show unto your honors, that the said William W. Woodworth, administrator as aforesaid, by his deed dated the fourteenth day of March, eighteen hundred and forty-five, and duly recorded in the Patent Office at Washington, conveyed and assigned unto the said James G. Wilson all the right, title and interest of the said William W. Woodworth, administrator as aforesaid, in and to the said letters patent, and the franchise thereby granted and secured, for the said term of seven years, created and extended by the said Act of Congress, to wit, for the term of seven years from and after the twenty-seventh day of December in the year eighteen hundred and forty-nine.

And your orators further show unto your honors, that doubts afterwards being entertained of the correctness and accuracy of the said specification, and the said letters patent being found to be inoperative, the same were duly surrendered on account of the said defective specification; and such surrender having been accepted by the Commissioner of Patents, the said commissioner did, in due form of law, issue to the said William W. Woodworth, administrator as aforesaid, letters patent bearing date on the eighth day of July in the year eighteen hundred and forty-five, granting to the said William W. Woodworth, in trust for the heirs at law of the said William Woodworth, their administrators and assigns, for the residue of the term of twenty-eight years from the said twenty-seventh day of December, eighteen hundred and twenty-eight, the exclusive right of making, using, and vending to others to be used, the improvement claimed and described in the amended specification to the letters patent last aforesaid, annexed to which said last-mentioned letters patent, or a duly certified copy thereof, your orators crave leave to refer as a part of their bill.

And your orators further show unto your honors, that since the issuing of the said new letters patent to William W. Woodworth, the said Woodworth, by his deed dated the ninth day of July, eighteen hundred and forty-five, and recorded in the Patent Office at Washington aforesaid, granted, assigned and confirmed unto the said James G. Wilson and his assigns all the right and title acquired by

him, the said Woodworth, in and by the issue of the said letters patent, with the amended specifications as aforesaid.

And your orators further show unto your honors, that the said James G. Wilson, by his deed dated on the twenty-first day of June, eighteen hundred and forty-five, granted, conveyed and assigned unto Richard Borden and Jefferson Borden, both of Fall River in the County of Bristol and District of Massachusetts, all the right, title and interest of him, the said James G. Wilson, of, in and to the said last extension granted by Congress, as aforesaid, for the State of Rhode Island (with the exception of the island of Rhode Island in Newport County) and the whole of the County of Bristol in the State of Massachusetts.

And your orators further show unto your honors, that the the issuing of the said new letters patent, with the amended specification, the said James G. Wilson, by his deed dated on or about the twenty-eighth day of May, eighteen hundred and fifty, and duly recorded in the Patent Office aforesaid, granted, assigned and confirmed unto the said Richard Borden and Jefferson Borden and their assigns, all the right, title and interest assigned to them by the said Wilson by his deed aforesaid dated the twenty-first day of June eighteen hundred and forty-five, for and during the said last extended term; to wit, seven years from and after the twenty-seventh day of December, eighteen hundred and forty-nine.

And your orators further show unto your honors, that the said Richard Borden and Jefferson Borden, by their joint deed dated on or about the twenty-ninth day of June, eighteen hundred and forty-nine, and duly recorded in the Patent Office aforesaid, granted and assigned to Nathan Mason, of Providence and State of Rhode Island, his administrators and assigns, the exclusive right (for the said second extended term of the said patent, to wit, seven years from and after the twenty-seventh day of December, eighteen hundred and forty-nine) of constructing, using, and vending to others to construct and use, twenty of said machines, constructed according to the letters patent issued as aforesaid, with the amended specifications annexed, within the Counties of Providence, Washington and Kent in the State of Rhode Island, and one and one half miles from the

east shore of Lekonk river in the town of Lekonk, County of Bristol and State of Massachusetts (with the exception of a district of three and a half miles north, east and west, and two miles south of Pawtucket bridge in the town of North Providence in the said County of Providence, which said district had been conveyed to the Pawtucket Planing Company in said North Providence), also within the said district to dispose of the plank or other material dressed and prepared by said machine.

And the said Bordens, by their said deed, warranted and covenanted with the said Mason that they would not grant any license to any other person whatsoever to make, use, or vend to be used, any of said planing machines in and for the district aforesaid, and that they and their assigns would not use nor construct any of said machines within the district aforesaid.

And your orators further show unto your honors, that afterwards, to wit, after the re-issue of the said letters patent, with the amended specifications, the said Richard Borden and Jefferson Borden, by their joint deed dated on the thirteenth day of June in the year eighteen hundred and fifty, and recorded in the Patent Office aforesaid, and in consideration of the sum of one dollar paid to them by the said Nathan Mason, and for other good considerations, granted and confirmed unto the said Nathan Mason and his assigns all the rights and privileges assigned and conveyed to him by their said deed dated the twenty-ninth day of June, eighteen hundred and forty-nine, for and during the term of seven years from and after the twenty-seventh day of December, eighteen hundred and forty-nine, in and for the territory described in said deed dated the twenty-ninth of June, eighteen hundred and forty-nine and also the exclusive right to run twenty machines, constructed according to said Woodworth's patent, within the district or limits described in the said deed or grant, dated the twenty-ninth of June, eighteen hundred and forty-nine, for and during the residue of the said term of seven years.

And your orators further show unto your honors, that the aforesaid William Tallman and James C. Bucklin, of Providence aforesaid, are now using five of the said machines, substantially the same in

construction and mode of operation as the planing machine in the said letters patent mentioned, the exclusive right to make, use and vend which is by law vested in your orators, and that the said defendant used the same for some time past, but how long in particular your orators are not informed and cannot set forth, but pray that the said defendants may discover and set forth the same; and thereby the said defendants did and still do infringe upon the exclusive privileges intended to be secured to your orators by the said letters patent. And your orators further show unto your honors, that heretofore, viz., at the term of this honorable court begun and holden at Boston within and for the District of Massachusetts, on the fifteenth day of October in the year of our Lord one thousand eight hundred and forty-three, certain persons named Washburn and Brown impleaded one James Gould in an action at law, wherein they declared against him in a plea of trespass on the case, for a violation of the exclusive privileges of the said Washburn and Brown, secured to them by the letters patent and grant aforesaid, by using a machine substantially the same in its construction and mode of operation as the said planing machine invented by the said William Woodworth; and thereupon, the said suit at law having been duly continued from said term to the term begun and holden at Boston within and for the said District of Massachusetts, on the fifteenth day of May in the year of our Lord one thousand eight hundred and forty-four, the said Gould having pleaded that he was not guilty in manner and form as the said plaintiffs have declared against him, and issue being joined thereon, the cause was committed to a jury, who returned their verdict therein upon oath, and found that the said Gould was guilty in manner and form as the said plaintiffs have declared against him, and assessed damages in the sum of fifty dollars. And afterwards, at the same term of said court, a motion for a new trial of the said action having been made by the said Gould and overruled by the court, judgment was rendered on the said verdict in favor of the said plaintiffs for their aforesaid damages and costs.

And your orators further show unto your honors, that heretofore, to wit, at the term of this honorable court begun and holden at Boston aforesaid within and for the District of Massachusetts, on the

fifteenth day of October in the year eighteen hundred and forty-seven, the said William Woodworth impleaded Rodolphus C. Edwards, James H. Edwards and Cyrus Smith, in an action at law for a violation of the aforesaid exclusive privileges secured to the said William W. Woodworth, by using a machine substantially the same in its construction and mode of operation as the said planing machine invented by William Woodworth; and such proceedings in the said suit were afterwards had, that at the same term of the court, the said Edwards and others having pleaded that they were not guilty in manner and form as the plaintiff had declared against them, and issue being joined thereon, the said cause was committed to a jury, who returned a verdict thereon upon oath that the said Edwards, Edwards and Smith were guilty, in manner and form as the said plaintiff had thereof declared against them, and assessed damages therein in the sum of five hundred dollars.

And afterwards, at a term held on the fifteenth day of May A.D. 1848, at Boston aforesaid, a motion for a new trial of the said cause having been made by the said Edwards and others, the same was overruled by the court, and judgment was rendered on the said verdict in favor of the said plaintiff in said cause for his said damages and costs.

And your orators have requested the said Tallman and Bucklin to desist and refrain from further using the said machine, and to account with and pay to your orators the damages sustained by your orators by reason of the unlawful use of the said machine by the said defendants, or the profits made by them by such use, which said Tallman and Bucklin refused to do, which is contrary to equity.

To the end therefore that the said defendants may, if they can, show cause why your orators should not have the relief hereby prayed, and may upon their several and respective corporal oaths, and according to the best and utmost of their several and respective knowledge, remembrance, information and belief, full, true, direct and perfect answer make to such of the several interrogatories hereinafter numbered and set forth, as by the note hereunder written they are respectively required to answer, that is to say, —

1. Whether the said letters patent were granted and issued as above stated?

2. Whether the said letters patent were renewed and extended as is above stated?

3. Whether the disclaimer aforesaid was filed as is above stated?

4. Whether the grants by the said William W. Woodworth to the said Wilson were respectively made as is above stated?

5. Whether the said actions at law were commenced and prosecuted, and the said verdicts and judgments recovered, as is above stated?

6. Whether the said defendants have, at any time and when and during what period of time, either severally and each by himself or jointly with any and what other person or persons, used any planing machine, and where; and whether or not the same was not substantially the same in its construction and mode of operation as the said planing machine of the said William Woodworth, and how the same differed therefrom, if at all?

7. Whether or no such planing machine was used to plane boards, for the use of the said defendants, or either of them, or for customers and the public generally; and if the former, whether or no any, and if any, how much, cost and expense was saved by means of such machine; and if the latter, how much profit has been realized therefrom, and what quantities of boards or other material have been so planed, and at or after what rates or prices, and what expenses were incurred in the operation of planing?

8. Whether the grants by the said James G. Wilson to the said Richard Borden and Jefferson Borden were made as is above stated?

9. Whether the grant by the said Richard Borden and Jefferson Borden to the said Nathan Mason were made as is above stated?

And that the said defendants may answer the premises, and that they may be decreed to account for and pay over to your orators all such gain and profits as have accrued to them from using the said machines since the expiration of the said original letters patent; and that they may be restrained by an injunction issuing out of this honorable court, or issued by one of your honors, according to the form of the statute in such case made and provided, from using or

vending any one or more of the said machines, substantially the same in its construction and mode of operation as the said patentee's planing machine; and that the machine or machines now in the possession of the said defendants, or under their control, may be destroyed or delivered up to your orators; and for such further or other relief as the nature of this case may require, and to your honors may seem meet:

May it please your honors to grant unto your orators, not only a writ of injunction conformable to the prayer of this bill, but also a writ of subpœna, directed to William Tallman and James C. Bucklin, of Providence in the district aforesaid, planers, and commanding them and each of them to appear and answer unto this bill of complaint, and to do and receive what to your honors shall seem meet.

NATHAN MASON,
WILLIAM W. WOODWORTH,
Adm'rs of WM. WOODWORTH,
JAMES WILSON,
RICHARD BORDEN,
JEFFERSON BORDEN,
by AMER & PAYNE.
NATHAN MASON.

AMER & PAYNE,
of Counsel with the Plaintiffs.

RHODE ISLAND DISTRICT, sc.

CIRCUIT COURT,
At NEWPORT, JUNE TERM, 4th day (July 18), 1850.

Then personally appeared the above-named Nathan Mason, and made oath that the facts and statements in said bill, by him signed, were true and correct according to the best of his knowledge and belief.

JOHN T. PITMAN,
Clerk.

District of Rhode Island.

Clerk's Office, Circuit Court,
At Providence, June, A.D. 1876.

I, Henry Pitman, clerk of said court for said district, do hereby certify that the foregoing fifteen pages contain a true copy from the original now on file in this office, in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said court, and [SEAL] my hand, on the day and year above written.

HENRY PITMAN,
Clerk.

DEFENDANT'S EXHIBIT By.—D.B.H., Special Examiner.

Certified Copy of Final Decree in the Suit of Mason *et al. v.* Tallman & Bucklin, R.I. District, November Term A.D. 1850.

[Put in Evidence, Page 365, Vol. 1.]

DISTRICT OF RHODE ISLAND,

Circuit Court of the United States, within and for the Rhode Island District, at its November Term A.D. 1850.

Mason
v.
Tallman & Bucklin, } In Equity.

This cause came on to be heard on motion of the complainants that said bill should be taken *pro confesso*, for default of answering the same; whereupon it was ordered and decreed by the court, that said bill should be taken *pro confesso*, for default in answering the same, and that the said defendants, their agents and servants, be perpetually enjoined from using any one of the said machines in the said bill mentioned, and from making, using or vending any other

machine or machines, in violation of the rights of the complainants under the last extension of the said letters patent; and that the said complainants have and recover of the said defendants all costs of this suit, to be taxed by the clerk.

Let this decree be entered as of record.

JOHN PITMAN,
District Judge.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, clerk of said court for said district, do hereby certify that the foregoing page contains a true copy, from the original now on file in this office, in the cause in equity, Nathan Mason *et al.* *v.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said court, and [SEAL] my hand, on the day and year above written.

HENRY PITMAN,
Clerk.

DEFENDANT'S EXHIBIT Bx. — D.B.H., Special Examiner.

CERTIFIED COPY OF MOTION FOR COMMITMENT FOR CONTEMPT IN THE SUIT OF MASON *et al. v.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

RHODE ISLAND DISTRICT, SC.

CIRCUIT COURT OF THE UNITED STATES.

In Equity.

A motion for commitment for contempt of the decree of this honorable court in the case

Nathan Mason *et al.*
v.
Tallman & Bucklin.

Nathan Mason, of Providence in the County of Providence and State and District of Rhode Island, showeth unto this honorable court that heretofore, to wit, on or about the 19th day of June A.D. 1850, is exhibited is this honorable court a bill of complaint against William Tallman and James C. Bucklin, in which said bill of complaint your petitioner alleges that said Tallman & Bucklin had infringed upon and violated certain rights and privileges of your petitioner, as assignees of certain letters patent of the United States, originally issued to William Woodworth, for an improved method and machinery for working boards; and in due course of equity, prosecuted said bill of complaint to final decree against the said Tallman & Bucklin, enjoining them from using machines or vending said machines; all which appears of record in this honorable court; to which record your petitioner craves leave to refer your honors, and hereby makes the same a part of this his petition.

And your petitioner would further show unto your honors, that in open violation of said decree of this honorable court, the said Tallman & Bucklin, their agents and servants, have been and are now using one or more of said machines in said bill of complaint mentioned,

and have been and are now making, using or vending other machines or machine in violation of the rights of your petitioner.

Wherefore your petitioner prays that said Tallman & Bucklin may be committed for contempt of the said decree of this honorable court, and that your petitioner may have such other relief in the premises as to equity and justice may appertain.

And as in duty bound will ever pray.

NATHAN MASON.

RHODE ISLAND DISTRICT, sc.

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, April 23, 1851.

Then personally appeared the said Nathaniel Mason, subscribed to the foregoing, and made oath that the facts and statements in the foregoing petition contained are true and correct according to the best of his knowledge and belief.

Before me,
JOHN T. PITMAN,
Clerk.

DISTRICT OF RHODE ISLAND.

CLERK'S OFFICE, CIRCUIT COURT.
At PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, clerk of said court for said district, do hereby certify that the foregoing two pages contain a true copy from the original now on file in this office, in the cause in equity, Nathan Mason *et al. vs.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said court, and [SEAL] my hand, on the day and year above written.

HENRY PITMAN,
Clerk.

DEFENDANT'S EXHIBIT Bw.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE OPINION OF THE COURT ON THE MOTION FOR CONTEMPT, IN THE SUIT OF MASON *et al. v.* TALLMAN & BUCKLIN, R.I. DISTRICT.

[PUT IN EVIDENCE, PAGE 365, VOL. 1.]

MOTION FOR PROCESS OF CONTEMPT FOR NOT OBEYING FINAL DECREE.

Nathan Mason
v.
Tallman & Bucklin, } In Equity.

This is a motion on the part of Nathan Mason for an attachment against Tallman & Bucklin for contempt in not obeying the final decree of this court, made at the last November term. On the nineteenth day of June, 1850, a bill was filed by Nathan Mason and others against Tallman & Bucklin, which alleged that the plaintiffs were owners of the patent right of Woodworth's planing machine, and that the said Tallman & Bucklin, in violation of the same, were using five of said machines in the city of Providence; the bill prayed for a preliminary and a final injunction. Upon the hearing of the motion for a preliminary injunction, the respondents claimed the right to use the said machines during the time of the last extension of the patent, under a purchase of a right to use the same made previous to said extension; and upon question the parties were heard before the circuit court at the last June term thereof, and the opinion of the court being against the right set up by the respondents, a preliminary injunction was ordered, unless the respondents gave a sum to amount and pay over the profits arising from the use of said machines, or to pay to the plaintiff at the of the respondents the price customary for the use of said machines. A bond to amount and pay over the profits was filed by the respondents, dated the fifth day of August A.D. 1850. In September following, the workshop of the respondents was burned up and

the machines destroyed. The respondents made no answer to the bill; and at the last term of the circuit court they were ordered to make answer to the same within fifteen days; and the same not being done, the bill on motion was taken *pro confesso*, and a final decree entered, by which the said defendants were enjoined from using any one of the said machines in the said bill mentioned, and from making, using or vending any other machines or machine in violation of the rights of the complainants under the last extension of the said letters patent.

For an alleged breach of this decree, process of contempt is now sought for, under this motion, against the said Tallman & Bucklin.

In answer to this motion Tallman & Bucklin have appeared, and for cause why said process should not issue against them, state, under oath, that the machines, for the using of which the said bill was brought against them, were destroyed by fire in the early part of September last; and that the four machines they now use are not in violation of the Woodworth patent; that the two planing machines which they now use are under the patent of Nicholas G. Norcross, they having purchased a right of him to use the same; that they use a moulding machine upon a different construction and principle from the Woodworth machines; and that they are using a machine for tonguing and grooving also upon a different construction and principle from the Woodworth patent.

It is admitted that the planing machines are constructed and used under the Norcross patent, and as to these it is agreed that the right to use them cannot be tried upon this motion.

In reference to the moulding and tonguing and grooving machines, it is contended by on behalf of Mason, that they are the same in construction and principle as the said Tallman & Bucklin used before the filing of said bill, and which were destroyed by fire in September last, and therefore that the use of these are a plain violation of the said decree.

In reference to the moulding machines there are several respectable witnesses who have sworn that they do not consider this as a violation of the Woodworth patent, and state their reasons for the same.

And in reference to the tonguing machines, the respondents swear that this is not similar to the machine they used before; that the cutter wheels in the machine which they now use for tonguing and grooving are not used in combination with pressure rollers, or with rotating planes, or with any other device or combination similar to those used in the Woodworth machines. In this they are supported by the affidavits of Arnold Peters, Joseph Reynolds, Larned Scott and Steny Kelley.

But it is said that the question in reference to the moulding and tonguing and grooving machines, which has already been decided in this cause, and having been *adjudicated*, is not now to be re-examined by me on this motion.

This is denied by the defendants, and it is said if I decide it in this summary way I deprive the party of his legal rights of a trial by jury, and of all right of appeal.

In this cause I do not consider anything as having been formally adjudicated, except the question which was submitted to the court on the motion for a preliminary injunction. This bill is taken *pro confesso*, and so far as that goes, the defendants are estopped by their confession. But the bill does not particularly describe these machines.

The allegation in the bill is, "that the aforenamed William Tallman and James C. Bucklin are now using five of the said machines, substantially the same in construction and mode of operation as the planing machine in the said letters patent mentioned."

These various operations are mentioned, not certainly as being the same, but different. The whole may be embraced under the general name of planing machines, for the general purposes of a name. But where certainty to a more specific intent is required, so as to conclude defendant and estop him, by a bill taken *pro confesso*, for want of an answer, it appears to me that the allegation is not sufficiently specific, and that under such a bill, taken *pro confesso*, that defendant confesses with no more certainty than the bill alleges.

In this case the confession is that the five machines used by the defendants, at the filing of the bill, were substantially the same as the planing machine in the said letters patent mentioned, and this

was quite sufficient to authorize a perpetual injunction to prevent the using of these machines. But when *other* machines are used there is nothing in the confession of such a general bill to estop the defendant from denying that these other machines are not substantially the same as the planing machine in the said letters patent mentioned, and in reference to these other machines this question must necessarily remain an open question to be adjudicated upon.

Here the final decree enjoins the defendant from using any one of the said machines in the said bill mentioned; but in reference to the use of other machines, they are enjoined from making, using or vending any *other machines* or machine in violation of the rights of the complainants, where they are called in question for using any other machines; they are certainly not estopped by the bill or decree from denying that these machines are not in violation of the rights of the complainant. And if they do deny it, as they have in this case, upon their oath, supported by various affidavits, how is this to be tried? By a single judge sitting at his chambers, upon a motion to commit the defendant for a violation of the decree, by which the defendant can conclude without appeal?

I am not disposed to examine such a in such a case, and I do not see that I am called upon to examine it. If the complainant was thereby left without remedy there might be more reason for the exercise of a summary power. But he is not; he may file a bill and obtain an injunction to prevent the use of these machines, and the respondents will have all their rights renewed to them of trial by jury and appeal.

Under the various affidavits which have been filed in this case, on both sides, I do not feel myself called upon to decide whether these grooving and moulding machines are or are not violations of the rights of the complainants. It is sufficient for me that they present a case about which much may be said, as much has been said, on both sides, about which judges and men may differ, as these affidavits show, and therefore that I ought to conclude the respondents from their rights, in reference to these machines, by a summary judgment which admits of no appeal, but that I should leave the complainant

to that remedy which will give him the relief sought without impairing the rights of the respondents.

With no authorities to enlighten me upon the peculiar question involved in this motion, as to how far I ought to go in deciding whether other machines than those complained of in the bill are a violation of the rights of the complainant, so that I should be justified in issuing the process sought for under this motion, and especially in a case where there is conflicting testimony, I have come to my present conclusion, not with the most perfect satisfaction, but as one in which, if I have erred, my error may be corrected, and therefore as a safer conclusion than one which would not admit of these corrections.

DISTRICT OF RHODE ISLAND,

CLERK'S OFFICE, CIRCUIT COURT,
At PROVIDENCE, June 12 A.D. 1876.

I, Henry Pitman, clerk of said court for said district, do hereby certify that the foregoing seven pages contain a true copy from the original now on file in this office, in the cause in equity, Nathan Mason *al. et v.* Tallman & Bucklin.

In testimony whereof I have hereunto set the seal of said court, and [SEAL] my hand, on the day and year above written.

HENRY PITMAN,
Clerk.

DEFENDANT'S EXHIBIT Bu.—D.B.H., Special Examiner.

CERTIFIED COPY OF THE SPECIFICATION AND DRAWING OF THE LETTERS PATENT OF THE UNITED STATES, GRANTED S. S. GRAY, NO. 11,582, DATED AUGUST 22, 1854.

[PUT IN EVIDENCE, PAGE 374, VOL. 1.]

Solomon S. Gray, of South Boston, Mass., assignor to S. S. Gray and S. A. Woods, of South Boston aforesaid, Letters Patent No. 11,582, dated August 22, 1854.

To all to whom these Presents shall come:

Be it known that I, S. S. Gray, of South Boston in the County of Suffolk and State of Massachusetts, have invented certain new and useful improvements in planing machines, of which the following is a full, clear and accurate description, reference being had to the annexed drawings making part of this specification, in which —

Fig. 1 is a perspective view of a planing machine with my improvements attached.

Fig. 2 is a section through the cutter cylinder and the parts immediately connected therewith.

Fig. 3 is a view of the bar which prevents the board from being raised by the action of the cylinder cutters.

Fig. 4 is a front view of the cutter head and cutter.

Fig. 5 is a plan of the travelling bed with the clamps for securing the lumber.

Planing machines may be divided into two classes, — those in which pressure is applied to the plank before and behind the cutter, and which reduce boards to an uniform thickness, and those which are calculated to plane out of wind, and in which, consequently, no pressure can be applied to the board.

In machines of the latter class, of which the "Daniells planer" is an instance, it has not been found practicable to make use of cylin-

der cutters, as these require that the board be held firmly upon its bed, or, at least, that it be prevented from rising therefrom; the necessity has therefore existed, in machines for planing out of wind, of using cutters which revolve horizontally across the board, the operation of which is very slow.

The first part of my invention consists in a peculiar construction of cutter head for the purpose of more effectually turning and breaking the shavings, the duty of the cap being performed by a portion of the cutter head, which is peculiarly formed for the purpose, as will be hereafter more fully explained.

My second improvement consists in a peculiar form of clamp, which is especially applicable to "Planing Machines" of this class, by which boards with inclined ends may be instantaneously and securely dogged, or pieces of different lengths may be planed at the same time.

To enable others skilled in the art to make and use my invention, I will proceed to describe the method which I have adopted of carrying it out.

The general features of the machine, as they do not differ from those of others of this class, need not be here described.

A is the cutter head, of the form represented in fig. 2, the plane irons *a* being secured to it by the screws *b*, working in slots in the planing irons. Immediately back of the cutting edge of the planing iron, the cutter head is made concave, as seen at *c*, fig. 2, for the purpose of bending over and breaking the shaving. The cutter head itself is thus made to form the cap of the iron, its concave form, immediately behind the cutting edge, adapting it peculiarly to this purpose.

The cutter head is raised and lowered in the usual manner in its frame B, by means of the screw C, and is clamped firmly to its ways by the thumb nuts *f*.

E is the clamp seen in plan in fig. 5. The body of the clamp is pivoted at its centre *d*, upon the end of the screw F, which works in the nut *g*, and is operated by the hand wheel G. The dogs *h* are pivoted to the body of the clamp, and may be secured by means of the thumb nuts *k* in any position required for the purpose of holding pieces of different lengths, or of dogging boards with oblique

ends. One end of the board being secured to the movable dog H, the dogs *h* are made to bear upon the other end of it; the thumb nuts *k* are then tightened, and the clamp, which is forced up by turning the screw G, adjusts itself by swivelling upon the point *d*, until both its dogs have an equal bearing upon the end of the board. Both the dog H and the clamp E are secured to the movable bed I, which carries the lumber through the machine.

For the purpose of holding the dog H securely to the bed of machine, and also to enable it to be readily and quickly moved to accommodate it to the different length of boards to be planed, I make use of the following device: *l* are teeth or cogs which are suitably secured to both sides of the bed of the machine, as seen in the drawings, the advance side being inclined and the top curved, as represented in the different views given in fig. 5.

The dog H is furnished with side pieces, *m*, *m*, which are so mortised upon their inner side as to fit over the cogs *l*, the inclined edge *n* of the mortise bearing against the under side of the cogs; the dog is thus held immovably and firmly to its place, while it may be instantaneously and easily moved at any moment that it becomes necessary.

1st. I claim the peculiar construction of cutter head herein described, the cutter head itself being made use of to turn and break the shaving in the manner of a double-iron plane, and being furthermore made concave for the purpose of facilitating this operation.

2d. I claim the clamp as herein described for the purpose of dogging the lumber to the bed of the machine, the body of the clamp being pivoted at *d* and forced up by the screw F, or its equivalent, the dogs *h* being adjustable therein, in the manner and for the purpose set forth.

3d. I claim the within-described method of securing the dog H to the bed of the machine by means of the teeth or cogs *l* and the mortises in the side pieces *m*, for the purpose set forth.

SOLOMON S. GRAY.

Witnesses,

SAM. COOPER,

JOHN S. CLOW.

Ex. — J.A.W.

DEFENDANT'S EXHIBIT Bt. — D.B.H., Special Examiner.

CERTIFIED COPY OF RE-ISSUED LETTERS PATENT OF THE UNITED STATES, GRANTED SOLOMON S. GRAY AND S. A. WOODS, No. 945, DATED APRIL 17, 1860.

[PUT IN EVIDENCE, PAGE 374, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Solomon S. Gray and S. A. Woods, of Boston, Massachusetts, assignees of Solomon S. Gray aforesaid, have alleged that Solomon S. Gray did invent a new and useful improved machine for planing lumber "out of wind" (for which letters patent were issued to them, as assignees as aforesaid, dated August 22, 1854, which letters having been surrendered by them, the same have been cancelled and new letters ordered to issue to them on an amended specification), which he stated had not been known or used before his application; had made oath that he was a citizen of the United States; that he did verily believe that he was the original and first inventor or discoverer of the said machine, and that the same had not, to the best of his knowledge and belief, been previously known or used; they having paid into the treasury of the United States the sum of fifteen dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said machine, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Solomon S. Gray and S. A. Woods, their heirs, administrators or assigns, for the term of fourteen years from the twenty-second day of August, one thousand eight hundred and fifty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said machine, a description whereof is given in the words of the said Solomon S. Gray and S. A. Woods in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this seventeenth day of April in the year of our Lord one thousand eight [L.S.] hundred and sixty, and of the independence of the United States of America the eighty-fourth.

JACOB THOMPSON,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

PHILIP F. THOMAS,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, Solomon S. Gray and S. A. Woods, both of Boston in the County of Suffolk and State of Massachusetts, assignees of Solomon S. Gray aforesaid, do hereby declare that the said Solomon S. Gray did invent certain new and useful improvements in planing machines; and for the purpose of obtaining a reissue, we do hereby declare that the following is a full, clear and exact description of the same, reference being had to the annexed drawings making a part of this specification, in which —

Figure 1 is a perspective view of a planing machine with the improvements attached.

Figure 2 is a section through the cutter cylinder and the parts immediately connected therewith.

Figure 3 is a view of the bar which prevents the board from being raised by the action of the cylinder cutters.

Figure 4 is a front view of the cutter head and cutter.

Figure 5, a plan of the travelling bed with the clamps for securing the lumber.

Planing machines may be divided into two classes: those in which pressure is applied to the plank before and behind the cutter, and which reduce boards to an uniform thickness, and those which are

calculated to plane out of wind, and in which, consequently, no pressure can be applied to the board. In machines of the latter class, of which the "Daniels planer" is an instance, it has not been found practicable to make use of cylinder cutters, as these require that the board be held firmly upon its bed, or at least that it be prevented from rising therefrom. The necessity has therefore existed, in machines for planing out of wind, of using cutters which revolve horizontally across the board, the operation of which is very slow. The first part of my invention consists in a peculiar construction of a cutter head, for the purpose of more effectually turning and breaking the shavings, the duty of the cap being performed by a portion of the cutter head which is peculiarly formed for the purpose, as will be hereinafter more fully explained, and also in using with said cutter head and a travelling bed, a bar to prevent the board from casually rising from its proper place.

My second improvement consists in a peculiar form of clamp, which is especially applicable to "Planing Machines" of this class, by which boards with inclined ends may be instantaneously and securely dogged, or pieces of different length may be planed at the same time.

To enable those skilled in the art to make and use the invention aforesaid, we will proceed to describe it.

The general features of the machine, as they do not differ from those of others of this class, need not be here described.

A is the cutter head of the form represented in figure 2, the plane irons *a* being secured to it by the screws *b*, working in slots in the planing irons immediately back of the cutting edge of the planing iron; the cutter head is made concave, as seen at *c*, figure 2, for the purpose of bending over and breaking the shaving.

The cutter head itself is thus made to form the cap of the iron, its concave form immediately behind the cutting edge adapting it peculiarly to this purpose. The cutter head is raised and lowered in the usual manner in its frame, B, by means of the screw C, and is clamped firmly to its ways by the thumb nuts *f*. E is the clamp seen in plan in figure 5. The body of the clamp is pivoted at its centre, *d*, upon the end of the screw F, which works in the nut *g*,

and is operated by the hand wheel G. The dogs *h* are pivoted to the body of the clamp, and may be secured, by means of the thumb nuts *k*, in any position required for the purpose of holding pieces of different lengths or of dogging boards with oblique ends.

One end of the board being secured to the movable dog M, the dogs *h* are made to bear upon the other end of it; the thumb nuts *k* are then tightened, and the clamp, which is forced up by turning the screw G, adjusts itself by swivelling upon the point *d*, until both its dogs have an equal bearing upon the end of the board. Both the dog M and the clamp E are secured to the movable bed I, which carries the lumber through the machine.

For the purpose of holding the dog M securely to the bed of the machine, and also to enable it to be readily and quickly moved to accommodate it to the different lengths of boards to be planed, I make use of the following device: *l* are teeth or cogs which are suitably secured to both sides of the bed of the machine, as seen in the drawing; the advance side being inclined and the top curved, as represented in the different views given in figure 5. The dog M is furnished with side pieces, *m*, *m*, which are so mortised upon their inner side as to fit over the cogs *l*, the inclined edge *n* of the mortise bearing against the under side of the cogs; the dog is thus held immovably and firmly to its place, while it may be instantaneously and easily moved at any moment that it becomes necessary.

To the frame B of the cutter head A, a bar, D, is attached by pendants. These pendants are secured to the frame by set screws, so that the bar D may be raised and lowered.

The bar D has a transverse position over the bed I, and when the machine is in operation, rests lightly on the board or stuff just behind the cutter head A, as shown clearly in figure 2. This bar D prevents the board from rising under the action of the cutters, and is an essential feature in a machine for planing "stuff" out of wind, for the "stuff" cannot be pressed down and kept firm on the bed, as in ordinary planing machines, as the "stuff" would then be sprung out of its warped form, and when planed would again resume said form. It is necessary therefore, that the "stuff" be firmly secured on the bed in its warped or winding state, which is done by the

manner of dogging hereinbefore described; and as the cutter head A, owing to its construction, will have a great tendency to raise the stuff by its action upon it, such contingency is fully obviated by the bar D, which bears very lightly on the "stuff" just back of the cutter head, and effectually compensates for any upward action of the cutter head on the "stuff."

We do not claim a pressure bar arranged to bear on the board or "stuff," and keep the same firmly down on the bed, for such device is used on ordinary planing machines, but —

We do claim as new, and desire to secure by letters patent, —

. . . . . .

Second. The clamp as herein described for the purpose of dogging the lumber to the bed of the machine, the body of the clamp being pivoted at *d*, and forced up by the screw F, or its equivalent, the dog *h* being adjustable therein, in the manner and for the purpose set forth.

Third. The within-described method of securing the dog M to the bed of the machine by means of the teeth or cogs *l*, and the mortises in the side pieces *m*, for the purpose set forth.

Fourth. I claim the bar D, or its equivalent, in combination with a rotary cutter head and travelling bed, I, provided with suitable dogs, for planing straight and out of wind, substantially as set forth.

SOLOMON S. GRAY.
S. A. WOODS.

Witnesses,
JAMES A. WOODBURY,
J. H. HATCH.

DEFENDANT'S EXHIBIT Bs.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED SOLOMON S. GRAY AND S. A. WOODS, NO. 26,902, DATED JANUARY 24, 1860.

[PUT IN EVIDENCE, PAGE 374, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Solomon S. Gray, of Boston, Massachusetts, has alleged that he has invented a new and useful improved Planing Machine (he having assigned his right, title and interest in said machine to himself and S. A. Woods, of said Boston), which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said machine, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said machine, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Solomon S. Gray and S. A. Woods, their heirs, administrators or assigns, for the term of fourteen years from the twenty-fourth day of January, one thousand eight hundred and sixty, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said machine, a description whereof is given in the words of the said Solomon S. Gray in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-fourth day of January in the year of our Lord one thousand eight [L.S.] hundred and sixty, and of the independence of the United States of America the eighty-fourth.

JACOB THOMPSON,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

WM. D. BISHOP,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Solomon S. Gray, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and improved planing machine, and I do hereby declare that the following is a full, clear and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which —

Figure 1 is a side view of my invention.

Figure 2, a side sectional view of ditto, taken in the line *x*, *x*, figure 3.

Figure 3, a transverse vertical section of ditto, taken in the line *y*, *y*, figure 2.

Figure 4, a horizontal section of ditto, taken in the line *z*, *z*, figure 2.

Figure 5, a detached plan or top view of the clamp.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to combine the two classes of wood-planing machines in use, viz., those which are used simply for reducing to a smooth surface boards or other lumber, for general purposes, and those which are used for reducing lumber to an even thickness throughout; that is to say, for planing lumber out of wind for joinery, cabinet and fine or finished work generally.

I propose to combine the two classes of machines in such a way that a very simple and efficient device will be obtained, capable of being used in both capacities equally as well as those made for either specialty, and thereby effect a great saving, as a combined machine, constructed according to my invention, will not greatly exceed in cost those made specially for either purpose, and will require but the same space as either of the ordinary machines.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A, A represent two parallel horizontal bars, supported at a proper height and forming ways for a bed, B, which, when required, is allowed to slide freely thereon. This bed B is provided at its under side with a longitudinal sunken rack, C, as shown in figure 3, and by dotted lines in figure 2, and when a feed movement is given the bed, a pinion, D, gears into the rack and communicates motion to it. To each bar A, an upright, E, is attached. The front edges of these uprights are bevelled off, as shown clearly in figures 1 and 2, and to these bevelled edges an adjustable frame, F, is attached, in which a rotary cutter head, G, is placed; the frame, and consequently the cutter head, being adjusted by a screw, H. One end of the bed B is provided with a clamp, I, and a dog, J, is placed on the bed, the dog and clamp securing the board and lumber to the bed when the latter has a feed movement given it. The parts above alluded to do not require a more minute description, as they may be seen in a machine patented by me, in conjunction with S. A. Woods, the twenty-second day of August, 1854, and the fourth day of September, 1855, said parts comprising a machine for planing out of wind.

K is the driving shaft of this machine; said driving shaft having two pulleys, a, a^1, placed on it, and both secured permanently to the shaft. Around the pulley a, a cross belt, b, passes, said belt also passing around a pulley, c, on the shaft L of the pinion D, the pulley c being fitted loosely on shaft L, but secured to it, when necessary, by a clutch, M, which is operated by a lever, N. See more particularly figures 3 and 4.

Around the pulley a^1 of the driving shaft K, a straight belt, d, passes, said belt d also passing around a loose pulley, e, on the shaft

L, the pulley *e* being also connected with the shaft L, when necessary, by the clutch M. On one end of the shaft L a small pinion, *f*, is placed, as shown in figures 1 and 4. On the end of shaft L, and adjoining the pinion, one end of a lever, O, is fitted. This lever O has toothed wheel, *g*, secured to it, which gears into the pinion *f*. P is a frame which is formed of two uprights, *h*, *h*, connected at their lower ends by transverse bars, *i*, *i*. In each upright *h* an adjustable bearing, *j*, is placed, said bearings having the journals of a roller, Q, fitted in them, and just below the roller Q a similar roller, R, is placed, the latter having its journals in fixed bearings in the uprights. The rollers Q, R are arranged precisely similar to the usual feed rollers employed on planing machines, and when in use on the within-described machine, perform the same function, as will be presently explained. The frame P is secured to one of the bars A by a bolt or pivot, *k*, which serves as a hinge for the same, so that the rollers may, when desired for use, be turned around transversely on the bars A, A, and when not required, turned around off from the machine and parallel with the bars A.

The operation is as follows: when the machine is to be used as a finisher, or to plane boards or lumber out of wind, the frame P is turned around off from the machine, and the "stuff" properly secured on the bed B, by means of the clamp I and dog J. The bed B is so adjusted that the pinion D may gear into the rack C, and the pulley *e* on the shaft L is connected with said shaft by means of the clutch M, the other pulley *c* being loose. Power is applied to the shaft K, and the cutter head G operates as usual on the "stuff," while the bed B feeds it along underneath the cutter head. In gigging back the bed B, the pulley *e* is detached and the pulley *c* attached to the shaft. When the machine is to be used as an ordinary planer for planing boards for siding and similar purposes, without reference to getting the "stuff" out of wind, the bed B is shoved back out of gear with the pinion D, the rollers Q, R turned around on the bars A, A, and the lever O adjusted so as to throw the wheel *g* in gear with the lower pinion *l*. The board or "stuff" is then passed between the rollers Q, R, which, as they rotate, feed the "stuff" under the cutter head and over the bed B, which is stationary in consequence of being thrown out of gear with the pinion D.

From the above description it will be seen that the same feeding mechanism is used in both cases; that is to say, the same shaft L drives both the bed B and the rollers Q, R, the latter being thrown in and out of gear with the shaft by adjusting the lever O.

The mechanism therefore employed in order to alter the working of the machine is very simple; but by this simple arrangement one machine is made to perform the work hitherto required to be done by two, and the means therefore of performing the two kinds of work is placed within the reach of almost all mechanics doing business in a small way.

I do not claim separately the feed rollers Q, R, nor the cutter head G, *nor do I claim* the bed B, for these parts have all been used; but —

I do claim as new and desire to secure by letters patent —

The combination of the feed rollers Q, R, and bed B, when used in connection with the mechanism composed of the shaft L, provided with the pinions D, *f*, and the lever O, provided with the pinion *g*, and the pinion *l* on the roller R, arranged substantially as shown, so that by a simple adjustment either the feed rollers Q, R, or the bed B may driven as occasion may require.

I further claim the manner as shown of attaching the roller frame P to the machine; to wit, by means of the joint or pivot *k*, so as to facilitate the adjustment of the rollers Q, R, as specified.

SOLOMON S. GRAY.

Witnesses:

JAMES W. ROLLINS,

W. H. L. SMITH.

DEFENDANT'S EXHIBIT Br. — D.B.H., Special Examiner.

POSTAL CARD ISSUED BY THE WOODBURY PATENT PLANING MACHINE COMPANY, AND SENT TO CHARLES BAKER, ESQ., WORCESTER, MASS.

[PUT IN EVIDENCE, PAGE 386, VOL. 1.]

Office of the Woodbury Patent Planing Machine Company,
No. 5 Pemberton Square, Boston, Mass., August 7, 1875.

The Woodbury Patent Planing Machine Company have compromised with the Planing Mill Defence Association, upon liberal terms, and have thus removed all opposition to the patent of Joseph Page Woodbury, granted April 29th, 1873.

Acting upon the same liberal principle that induced us to make the concessions asked for by the Planing Mill Defence Association, we now offer licenses to all persons not members of that association, using Planing or Moulding Machines with "pressure bars," at the rate of *Thirty Dollars* per annum, or three hundred dollars for the full term of the patent, for each machine so licensed, except one-head sticking machines, which will be charged fifteen dollars per machine per annum, or one hundred and fifty dollars for the full term of the patent.

All persons who take a license for use of the device covered by Patent No. 138,462, U. S. Patent Office, having fifteen years longer to run, within the next thirty days, will be given a receipt in full, without any additional expense for past use of the patent. Applitions for licenses will be made to

THE WOODBURY PATENT PLANING MACHINE COMPANY,
BOSTON, MASS.

DEFENDANT'S EXHIBIT Bq. — D.B.H., Special Examiner.

SUPPLEMENT TO THE "BOSTON DAILY GLOBE," MONDAY MORNING, NOVEMBER 29, 1875.

[PUT IN EVIDENCE, PAGE 389, VOL. 1.]

THAT PATENT AGAIN.

Argument of Samuel A. Duncan on the Scire Facias, at Washington.

A View of the Scire Facias Differing from the Opposition.

A STONE WALL OF AFFIDAVITS.

His Explanation of General Leggett's Letter: Personal Disappointment.

THE WOODBURY COMPANY READY TO FIGHT.

A Spicy History — How it is Claimed Mr. Gould Became a Champion and Got Advertised.

Legal Opinions, Decisions, &c.

BOSTON, Mass., November 27, 1875.

To the Editor of "The Globe:"

Sir, — So much has been said through the public press within the past few weeks, in relation to the matter of the "*Scire Facias*" proceedings recently instituted against the Woodbury Patent Planing Machine Company by the opponents of the patent, and which has

been decided in favor of the company, I have thought proper to lay before your many readers, selected extracts from the able argument of General S. A. Duncan, of New York, against the said petition, which resulted in the Solicitor General dismissing the same, and thus practically sustaining the patent in every issue raised in the case.

Very truly yours,

L. A. BIGELOW,

Treasurer of the Woodbury Patent Planing Machine Co.

MR. DUNCAN'S ARGUMENT.

THE OPENING.

It is said, your honor, that after the three or four days' terrible arraignment of Warren Hastings by Mr. Burke, Hastings said that he began to feel as if he was the greatest culprit the world had ever seen. I am free to confess that yesterday I felt myself somewhat in danger of falling into the same mood with reference to the Woodbury Company, as I listened to the polished, but keen and strong, denunciations of that corporation by the learned counsel for the relator. A night's rest, however, has restored my judgment, so that now I see clearly the real character, respectively, of that company and its assailants, and on which side the right in this controversy lies. The Woodbury Company has been denounced in argument here as having been "organized for purposes of litigation." It is denominated "a scheme for public plunder." It is styled "a gigantic conspiracy against the public." Now these are strong expressions. Viewed in a rhetorical light, they are perhaps beyond criticism; but when we apply to them the touchstone of truth, I can but express my astonishment that the learned counsel, with his large experience in matters of this kind, should have ventured upon this line of argumentation. The Woodbury Company was organized, sir, as all other corporations for similar purposes have been organized. It is a corporation based upon a patent, but created for the purpose of using that patent in a legitimate mode. If the opposition which

gentlemen all through the country, whether for good or for insufficient cause, have stirred up against the company, necessitates litigation, that is our misfortune; we accept the situation, indeed, but it should be remembered that it is under the compulsion of a necessity which is put upon us, and not from any choice of our own. It has been said that this company has adopted a system of granting licenses whereby the licensees are bound never to contest the validity of the patent; and this is thrown up against us as if it were something contrary to public policy; as if it were an outrage upon the rights of the community; as if it deserved the opprobrium of every right-minded man and the condemnation of the department of justice. But my friend upon the other side knows that nothing is more frequent in the management of patents than thus to bind licensees; and the peculiar character of the property which is based upon the grant of letters patent has rendered this an extremely prudent mode of management, and the rightness of it is never called in question in the courts of justice.

MR. THURSTON'S MATHEMATICS.

An attempt has been made to prejudice the mind of this tribunal against the company by the suggestion that untold wealth will accrue to the stockholders if this patent is not put out of existence. The mere statement of the proposition carries its own refutation. At the same time it may not be amiss to see whether there is any foundation to the proposition. Mr. Thurston has gone into a mathematical calculation substantially in this wise: that there are 25,000 machines in the country; if they are called upon to pay $30 each, annually, it will amount to thirty times 25,000 per year, or $750,000; and in seventeen years this will aggregate $12,750,000, a gigantic sum of money to be taken from the public and transferred to the treasury of a single corporation. My learned brother complains, therefore, that this is an excessive charge. But in almost the same breath he tells us that the only difference between the Woodbury machines and the old Woodworth planer, which for years was a popular and the principal machine in use through the country, and was unquestionably a splendidly operating machine, is, that the simple

pressure *bar* of the one has been substituted for the pressure feed *roller* of the other. Now, sir, is the tariff which the Woodbury Company has adopted an extravagant one? Is the charge one which the public will regard as burdensome; and is there any danger that the public will submit to a burdensome charge, which shall result in the unrighteous or the enormous enrichment of this company? If our tariff be in fact unjust and extravagant, all the remedy that the public can possibly ask they already have — the privilege of returning to the Woodworth feed roller.

A REASONABLE TARIFF.

The theory of the Woodbury Company, with reference to this device of the pressure bar, is this: that in reality it is worth to every user far more than it is proposed to charge him — $100 per annum, as an estimate of its value, would be an exceedingly low figure. Supposing it to be worth, however, but $50 per annum, then, certainly, the user of the machine can afford to pay $30 to this company, for his net gain would be $20. Just the moment that the company sets its figures at that point where the public find that they cannot afford to pay the royalty demanded, that moment the public will substitute for the pressure bar the old Woodworth feed roller, and thus the company, by over-shooting the mark, will fail altogether of deriving profit from an otherwise valuable property. This whole matter of tariff, then, may safely be left to regulate itself under the natural operation of the laws of trade.

ABOUT THE ROYALTY.

Again, the company has been most violently assailed because it has chosen to adopt the policy of charging a royalty upon the *use* of machines, rather than upon their manufacture. Well, sir, it would be no ground of complaint against this company if it were to send its agents to every manufacturing establishment throughout the land and to every planing mill, and say to every manufacturer and user of the Woodbury improvement, "Stop your machines from this day henceforth until the expiration of this patent." What is the grant which the government makes to a patentee? Is it the *exclusive* right

to control the invention, the exclusive right to make, to use and to vend? and so long as that grant continues in force, no member of the community has a right to lift his voice, by the way of remonstrance, if the patentee enforces, to its very letter — even to the extent of probibition — the grant which the government has made to him. It would not be wise for this company to adopt such a policy. I am speaking now of its abstract rights. It has chosen to adopt a sound business policy, and one which we shall see as we progress is meeting with the favor of a large majority of the users throughout the country.

Now, one of the most frequent modes of utilizing a patent is this very one which the company has adopted. A patentee may choose to manufacture machines and put them in the market, and thus, by holding the exclusive manufacture in his own hands, get a larger profit upon the manufactured goods than if he held no patent, and thus reap advantage from the grant which the government has made him; or, not choosing to enter upon the perilous business of manufacturing, he may parcel out his grant, licensing a manufacturer in New York, and another in San Francisco, and another in New Orleans, to make at a stipulated price; or, not choosing to lay a tax upon the manufacturer's business, the patentee may elect to collect royalties from the users, either upon the machines which they have purchased from other parties, or machines which they may purchase from the patentee himself, if so be he is a manufacturer.

Now, that is substantially the mode by which this company has chosen to manage this property which it has acquired by purchase; and I say it affords no ground whatsoever of attack, or even for unfavorable comment. If it did, the strong arm of the government might, with equal propriety and justice, be invoked to strike down one half of all the corporations in this country whose business is based upon letters patent for inventions.

THE TRUE GROUND OF COMPLAINT.

The real ground for complaint, may it please your honor, lies not against this company. The aggrieved party is the company itself; and I propose to ask your attention for a few moments to the history

of the relations existing between this company and this relator with his organized band of conspirators. The patent had hardly been issued before there were organized in the country two gigantic associations for the purpose of resisting any and all demands that might be made by the patentee — organized, in other words, for the avowed purpose of breaking down the patent.

THE BIRTH OF OPPOSITION.

You will understand, sir, that at that time there had been no suggestion from the company, or from Mr. Woodbury — the Woodbury Company was not at that time organized, I think — that he proposed to levy a tax upon the manufacturers. It was well understood that his line of policy looked to the collection of royalties from the users. Accordingly, the Users' Association was organized to resist any demands that he might make. Mr. Walter N. Greene was the chairman of the executive committee of that association, said committee being constituted with plenary powers, as indicated in the following resolution of the association, passed at their convention at Albany, September 24, 1873 : —

"*Resolved*, That an executive committee, consisting of three persons, shall be appointed by this meeting, and that said committee are authorized and directed to take such steps as they may deem advisable to protect the interests of those who are using planing machines with the adjustable and yielding bar, on which J. P. Woodbury lays claim to royalty. Said committee to be authorized and directed to employ counsel, experts, agents and others, as in their judgment may be deemed advisable, and are to have the usual authority of substitution and to fill vacancies on said committee that is proper in bodies politic or corporate, and to hold office during the pending of and up to the close of the litigations that may rise in the defence of members of the association, or in impeaching the validity of the patent of the said Woodbury.

"Said committee to have full powers upon all questions of compromise, prosecution and defence; and members of the association to be bound by their action."

AN HONEST COMPROMISE.

Mr. Greene's power as a member of that executive committee had never been revoked down to the time that the committee effected a compromise with the Woodbury Company in behalf of that association. And the same holds true with reference to Mr. Crapo and Mr. Jewett, the other members of that committee. During the past summer those gentlemen entered into negotiations with the Woodbury Company, which resulted in propositions that were deemed reasonable, and which, accordingly, were accepted by this executive committee of the Users' Association, and were by them recommended to the various members of the organization; not, bear in mind, *imposed* upon the members of the association who had bound themselves to accept any compromise adopted by the committee, but, I say, *recommended* by the executive committee to the various members of the association, for their individual adoption or rejection as their own private judgments and opinions might dictate. Now, it has been said, that that compromise was brought about by indirect means; by negotiations carried on in the dark; by misrepresentations. And in support of that, we have had here detailed and lengthy accounts of conversations carried on between Mr. Drew, Mr. Crapo, Mr. Thurston and Mr. Gould. But I pass over all of those, for I fail to see that they have any bearing whatsoever upon the questions now at issue.

The only vital and significant fact connected with these negotiations is this: that they resulted in a compromise between the Woodbury Company and this association of users. If there are individual members in that association of users, who for any reason choose to repudiate their obligations to the executive committee, or, in other words, to the whole association, as represented by the executive committee, with them we deal in another form. But it is in evidence here, that this compromise has been accepted in good faith by a very large number of the members of that association, who have come forward and paid their license fees, which have already gone into the treasury of the company.

MR. BIGELOW'S AFFIDAVIT.

I have here the affidavit of Mr. Bigelow, treasurer of the company; in which, after reciting the fact of the compromise effected with the Users' Association, he adds, —

"I further depose and say that each person and firm named upon the said printed list [referring to the list appended to the affidavit] has paid for a license to use the device covered by letters patent No. 138,462, upon the number of planing and moulding machines set opposite their respective names, and that the consideration in each case has not been less than $50 on each machine so licensed."

Appended to this affidavit is a list which represents users having from one to twenty-one machines. Licenses have been paid for, as represented by this list, upon between 600 and 700 machines. It is also stated to me by the treasurer of the company that they have a large number of letters from other members of the association — at least 200 members — stating that they accede to the terms of the compromise, but that, on account of the hard times, they are unable at present to send forward the license fees. This last act is not in proof, but I make the statement, and I presume it will be accepted by our opponents with the same readiness as their statement that they have *bushels of letters* from members of the association scorning and repudiating the compromise.

AFFIDAVIT OF JAMES SOPER.

I desire, also, in this connection, to read the affidavit of Mr. James Soper: "I, James Soper, a citizen of the United States, of lawful age, being duly sworn, do depose and say, that I am a manufacturer in lumber in Chicago, Illinois; that the firm of which I am a member use five machines; . . . that in the fall of 1873 I was made chairman of the committee of the Northwestern Planing Mill Defence Association; that said association was organized solely to test the claims of the Woodbury Patent Planing Machine Company for royalty upon pressure fixed or rigid bars used in planing lumber; that the said association numbered several hundred members who were using fully one thousand machines on which were the devices

covered by the patent of Joseph Page Woodbury; that in January, 1875, or thereabouts, I went to Boston, together with other mill-owners of Chicago, to urge upon the National Executive Committee of the Planing Mill Defence Association a compromise with the Woodbury Patent Planing Machine Company; that I met John T. Drew, counsel of said committee, and was informed by him that, while he might not be able to defeat said patent, yet he knew that he could institute *scire facias* proceedings against the same, and so harass the said company; that they would be glad to make a compromise on favorable terms, simply to get rid of the delays and expenses of a long contest in the courts; that in July, 1875, I was informed that a compromise had been made for the consideration of $100 for machines, for a fully paid-up license during the entire term of the patent from its issuing until its expiration; that I submitted the question of the acceptance of said compromise to the members of the association of the Northwest, several hundred in number, as aforesaid, and all agreed that it was wise and prudent to accept the compromise and acknowledge the validity of said letters patent, and pay the consideration demanded for the use of the device covered by said letters patent. Accordingly, I paid for the right to use five machines; and to my certain knowledge, several hundred other firms did the same. I fully believe in the validity of the said patent, and in the moderation and generous concession of the terms of the compromise made for the use of the same. I have no interest, directly or indirectly, in said patent, only as I have paid for a license."

Now, sir, as I have already said, it has been attempted to cast some slur upon these negotiations which have thus resulted in a harmonious understanding between this company and this large body of men, by associating with the negotiations the name of Mr. Drew — it being represented that he was intimately concerned in the negotiations, and the inference being intended that he was the agent of the Woodbury Company. I understand the fact to be that Mr. Drew, at that time, was, as he had been for a long period before, the counsel of Mr. Gould, the relator here present; and that, in that particular transaction, he was representing the executive committee of the Users' Defence Association. But no matter who he was, or

whom he represented — and no matter what falsehoods he may have told, if that be the charge these gentlemen make. It is sufficient to know that these negotiations have resulted in the breaking down, substantially, of that association; breaking it down, too, to the satisfaction of the great majority of the members thereof. And now these gentlemen, this relator and his associates, are moving heaven and earth to organize other associations to come in and continue the warfare upon our patent.

MR. GOULD NOT DAMAGED.

Now, sir, what is the position of this relator? How has he been injured by the existence of this patent, or anything that this Woodbury Company has heretofore done, or is proposing to do hereafter? Why should he, whose mouth must remain closed as to any grievance of his own, come into this presence and arraign our patent? for it is a significant fact, that no allegation as to damages or injury to himself, contained in his petition, has been substantiated by proof. Mr. Gould sets up in his petition that he has been subjected to an annoying correspondence. That would naturally befall a man who puts himself in the representative position which Mr. Gould has assumed, and who undertakes to play the rôle of champion of all the planing machine users through the country. But does he show that he has lost the sale of a single machine? Does he show that he has been injured to the extent of a single farthing in consequence of the existence of this patent? Has he said so in any affidavit which he has produced here before your honor? Is it a reasonable inference, from any testimony on file here, that Mr. Gould, or C. B. Rogers & Co., have been injured to the smallest extent? It is a significant question, sir; and I press it home upon these gentlemen, and should most gladly listen to any answer which they have to make.

P. T. BARNUM OUTDONE.

The amendment of the petition, it will be observed, contains no averment of injury or damage to Mr. Gould, or the company of which he is president. In point of fact, this whole proceeding, I apprehend, so far as Mr. Gould is concerned, is a shrewd scheme of

advertisement; and, if it had not been for the dullness of the season, I venture to say that the sales of C. B. Rogers & Co. for the year would be two-fold what they ever have been before. Nothing in the whole history of P. T. Barnum's operations for the past thirty years can compare with this most sagacious mode of advertising his concern, which Mr. Gould has resorted to — setting himself up as the champion of the planing machine users throughout the country; his name in the mouth of every one of them every day of the year. He could well afford to pay, from his own pocket, every dollar thus far expended in conducting the affairs of these associations, thus organized ostensibly to destroy an oppressive patent, but in reality manipulated by a few scheming manufacturing companies with a view to gaining notoriety, and thus, perchance, enlarging their own business. And it is to this end that they have been squeezing contribution after contribution out of the innocent, and, as the event has proved, gullible mill owners of the country! Mr. Gould is the last man to utter complaints because of any supposed or possible injury to his business. But, even putting that question aside, he fails altogether in proofs upon this question of injury to himself.

A SELF-CONSTITUTED CHAMPION.

Such being Mr. Gould's status, what does he do? No demand having been made upon him for royalties — the policy of the company, from the very beginning, being not to interfere with the manufacturers of machines — Mr. Gould, when he finds that the association of users have at last, by organized and persistent effort, accomplished the end which they had in view, which was to force the company into a compromise, when this had been done upon terms which the leading men of the association declare to be eminently moderate and generous, does everything in his power to stay the further operation of that compromise. He at once issues flaming circulars denouncing it as an outrage. He at once says, virtually, to the planing mill owners throughout the country: "You are not capable of taking care of your own affairs; you are being trapped and deceived into a compromise which you don't understand and which eventually will work you grievous injury. You don't know

enough to take care of your own business. Come to me and put your affairs in my hands, and I will protect you. Don't give up your fight against the patent in this way. I stand ready to take up the cudgel in your behalf if you have not the pluck to fight for yourselves." Do Mr. Gould's circulars indicate a desire to have this matter amicably settled? With these circulars before us, can we for a moment believe that he is acting in good faith, and with an eye single to the interests of the community, whose self-assumed champion he appears to be? Why, Mr. Gould said, in a letter addressed to Mr. Crapo, "I think I duly appreciate your efforts in trying to bring about a settlement of the difficulty, and I shall have no objection to the users taking any advantage they can that does not embarrass manufacturers."

MR. GOULD A MEDDLER.

Now a compromise has been made with the users which is in no way embarrassing to manufacturers; but the moment it is made, Mr. Gould puts on the war paint, and in the language of frenzy, almost, cries out to the gentlemen who are amicably settling their controversies with the company, and whose contributions will no longer aid to fill the treasury of the hostile associations, and thereby furnish their managers with free advertising: "It is a burning outrage to settle with this company which has no rights, upon such onerous conditions; let us organize anew and destroy the patent."

Mr. Gould says, in a circular addressed to the members of the Planing Mill Defence Association, under date of August 2, 1875, just after the compromise had been effected, "I think I can confidently predict, that it is the intention of the manufacturers to protect the interests of users of machines by defending against the Woodbury patent at their own expense; and this protest against the proposed arrangement for license is issued in order that no user of machines need subject himself and his business to the mercy of a patent-speculating company without being first fairly warned of the consequences."

Such is the good faith of this man, who, without having one particle of direct interest in this controversy, does anything in his power

to prevent an amicable settlement of the outstanding questions between the company and the users of the patented invention, a settlement upon the basis of a compromise which the great majority of them are exceedingly glad to adopt, and which the leading men declare to be eminently equitable and generous.

A LACK OF SINCERITY.

Now I apprehend that in fact this proceeding here, instituted in the name of a gentleman who is not shown to have any direct interest against our patent, has been instituted for the moral effect which will be produced upon the users of machines if success shall attend his petition. It is alleged by Mr. Bigelow, upon information and belief, that such is the fact. You will recollect, sir, that Mr. Gould denies, in his answering affidavit, that he has himself ever given occasion for such a statement. It is but due to Mr. Bigelow, that I should explain to you the circumstances under which he was induced to make the statement found in his affidavit, in which he says, "I further depose and say, that I am informed and believe that the design of the said association of manufacturers, as represented by the said Lyman Gould, in the said application to the Attorney General, is to obtain money which is to be used in opposing said patent; and that the said Lyman Gould has no intention or desire of pressing the same in the Circuit Court of the United States if authorized so to do; but, on the contrary, that it is publicly stated and declared by persons representing the said Gould and the said association, that they do not propose to press any such proceeding, and only desire to obtain the same for the moral effect it may have on those who are opposing the patent."

I am informed by Mr. Bigelow that this statement of his was made upon the strength of repeated conversations by officers of the company with the several counsel of the relator. I regret that Mr. Thurston is not here to-day; but these conversations, in part, took place at the time of the former argument before your honor. At that time, as I am informed, it was proposed in Mr. Gould's behalf to adjourn the hearing until the 1st of next January, it being represented that he was willing to do so, because he would thus have the

"moral effect" of the pendency of proceedings here, and if meanwhile the company did not proceed vigorously to prosecute infringers, he could on the first day of January call up the question.

A FAIR PROPOSITION.

I now find among the papers on file a memorandum proposition, in Mr. Drew's handwriting, which I understand to have been drawn by him at that time, and which is as follows: —

"*Whereas* an order for *scire facias* proceedings against patent No. 138,462, United States Patent Office, was granted by the Attorney General, May 11th, 1875; and *whereas* since that date the Woodbury Planing Machine Company, to whom has been duly assigned the patent aforesaid, have filed bills in equity against certain alleged infringers of said patent for the purpose of testing the validity of the same in the proper courts:

"Now, therefore, it is stipulated by counsel for the relator in the *scire facias* proceedings, and by the counsel for the Woodbury Planing Machine Company, that the *scire facias* proceedings shall be withdrawn without prejudice to either party, and to be renewed at any time the relator may think best."

Now if Mr. Gould really thinks that the company is not acting in good faith in its professed desire to have a *bona fide* suit, but covertly buys off all parties whom it sues, I make this proposition, which I trust will relieve him from any apprehensions of that kind in the future: if Mr. Gould will select, anywhere within the State of Massachusetts, any man who has purchased from him a pressure-bar machine since the issuing of our patent, we will file a bill against him within twenty-four hours. Mr. Gould or anybody else may defend.

THE QUESTIONS OF FRAUD DISCUSSED AND ANSWERED.

Now, as to the question of *fraud*. If it be true that there is any fraud involved in the grant of this patent, such as cannot be inquired into in collateral proceedings, as for the infringement of a patent, that undoubtedly will give you jurisdiction over the matter; but I think your honor must be satisfied beyond a reasonable doubt that

there is the element of fraud vitiating the patent, before you will consent to imperil the vested rights which have grown up upon faith in its validity, by even seeming to sanction these extraordinary proceedings, which are, I was about to say, without precedent in this country. In fact, so far as my memory now goes, I recall no instance in which suit has been instituted in our courts upon this ground of alleged fraud in the granting of a patent. It has, indeed, been said by the Supreme Court and by the Circuit Courts, in various cases, that suits may be instituted against a patent on the ground of fraud in its procurement; but I think no person opposing a patent has thus far adopted that relief.

Now, sir, what is this allegation of fraud, false suggestion, misrepresention? We find that Mr. Woodbury had a right, under the law of 1870, to refile his application; and the question arises whether, after he had refiled it, he deceived the commissioner into granting him a patent which, but for his alleged false representations, would not have been allowed. The gentlemen tell us that Mr. Woodbury came to the Patent Office and led the commissioner to believe that he had notified every man whom he found using this invention, the pressure bar, between the years 1852 and 1870, that the invention was one which he (Woodbury) had made, that it was one upon which he hoped some time to get a patent, and that when he procured a patent he should hold them to an accountability. The allegation is, that upon that representation of Mr. Woodbury, the commissioner, placing full confidence in it, granted him the patent.

In reply to that proposition — and it is the only respectable proposition which these gentlemen have presented through these many months of effort, and even it is not respectable — I have to say that there is no evidence whatsoever that the commissioner's mind was influenced in the slightest degree by that suggestion of Mr. Woodbury. And, furthermore, it was not incumbent upon Mr. Woodbury to make any suggestion of that kind to the commissioner; and the statement — for it is a fact that something of that kind does appear in his affidavit, filed in connection with the renewed application — was utterly immaterial. What was it necessary for the commissioner to know in considering that renewed application? He

was, of course, to inquire into the question whether Woodbury had abandoned his invention.

WHAT CONSTITUTES ABANDONMENT.

Now, sir, what is abandonment? What is dedication? And please bear in mind that there is a distinction to be drawn between "abandonment," as here used, and the term "forfeiture," as it occurs in other connections.

There is known to the patent law what the courts have denominated "a race of diligence" between rival inventors; and wherever that occurs, one man may forfeit his inchoate rights to the other, through negligence, delay, laches. If A be the first to conceive of an invention, partly reduces it to practice, halts, sleeps upon his rights, and B, conceiving of the same invention at a later date, proceeds with due diligence and is first to reduce the principle to practice, A is said, in the language of the courts, to have forfeited his rights by laches, and B becomes entitled to the patent.

But the term "abandonment" does not properly apply to that condition of things. Abandonment is where an inventor, having reduced his invention to practice, so deports himself as to lose his right to control the invention, possession passing over into the hands of the public. There may be such a thing as abandonment of a *patented* invention even — the dedication of it to the public. If I am the owner of a patent to-day, I may declare to the world that I do not propose to retain my exclusive privileges, in such mode and by such language as to confer upon the public the right to use the invention, and divest myself of all control over it. And so, when a man, having reduced his invention to practice, has acquired the right to secure a patent, he may so behave toward the public as to confer upon the public the right to the free enjoyment of that invention, and in such a way that he can never recall it. But, in order to such dedication or abandonment, the acts of the inventor must be so clear and explicit as to be susceptible of no misinterpretation.

OPINIONS OF JUDGE STORY AND JUDGE NELSON.

In Mellus *v.* Silsby, 4 Mason, 108, Judge Story said, with refer-

ence to this matter of dedication, "I am clearly of opinion that if the inventor dedicates his invention to the public he cannot afterwards resume it. It is like the dedication of a public way or other public easement. The question in such cases is a question of fact. Has he so dedicated it? I agree that his acts are to be construed liberally; and that he is not to be estopped by licensing a few persons to use his invention to ascertain its utility, or by any such acts of peculiar indulgence as shall and may fairly consist with the clear intention to hold the exclusive privilege. But if the inventor proclaims his intention to all the world" — that is, of course, his intention to dedicate the invention, — "and suffers it to go into general and public use without objection; if he asserts no exclusive right for years, with the full knowledge that the public are led by it to a general use, such conduct amounts to a strong proof that he waives the exclusive right and dedicates the invention to the world."

In McCormick *v.* Seymour, 2 Blatchf. 240, Judge Nelson had this question under discussion. I read from the syllabus: "The mere fact that an inventor makes and sells an invention, or puts it into public use, at any time within two years before he applies for a patent, is not, of itself, an abandonment of the invention to the public.

"Something more must be done within the two years; there must be some acts of the inventor indicating an intention on his part to devote his improvement to the public in general, in order to authorize a jury to come to the conclusion that he has so abandoned it.

"The law does not favor an abandonment, and throws upon the party who seeks to obtain the benefit of a forfeiture the burden of proving it *beyond all reasonable question*."

In Pitts *v.* Hall, 2 Blatchf. 229, Judge Nelson charged the jury upon this question of abandonment substantially as follows. I quote from the carefully prepared syllabus of the case: "There must be some declaration or act going to establish *an intention* on his [the inventor's] part to give to the public the benefit of his invention.

"Declarations of a determination not to take out a patent" — which would make out a very strong case — "but to let the public have the invention, will estop the party making such declarations, and any

one holding under him, from afterwards asserting his right against one who acts on the faith of those declarations.

"But declarations of an intention to dedicate an invention to the public will not be regarded as equivalent to an actual dedication. Besides words there must be acts in order to fasten upon the patentee the intention which, in judgment of law, will work an abandonment of his invention.

"Such an abandonment operates in the nature of a forfeiture of a right, which the law does not favor, and must be made out beyond all reasonable doubt."

These declarations of the courts indicate sufficiently what is meant by the term "abandonment." The question, then, before the commissioner was, whether Mr. Woodbury had committed such acts, had said such things, between the withdrawal of his old application and the filing of the renewed application, as would constitute an *abandonment* or a *dedication* of the invention to the public.

It does not appear that the office called upon Mr. Woodbury for any utterance upon this question. It was not necessary for Mr. Woodbury to go to the Commissioner of Patents in the face of the Gray precedent, and say, I have been very diligent in this matter; I have kept the public well informed of my rights; I have notified every man that I knew or heard of as a user or builder of these machines, and have thus preserved my rights. His rights were preserved independently of that. His rights were preserved, unless by positive, unmistakable, unequivocal acts of his he had dedicated or abandoned the invention, in the sense in which that term is used by the courts in the various decisions to which I have already referred, and numerous others which might be cited. That was the gist, then, of Mr. Woodbury's evidence when renewing his application, and his allegation upon the point of non-abandonment was the essential allegation which the commissioner must have received and acted upon.

COMMISSIONER LEGGETT'S LETTER DISSECTED.

I think I need say nothing more on this branch of the alleged fraud in the case, unless possibly to refer to the letter of the ex-Commissioner of Patents, which is published in the "Northwestern

Lumberman." You will understand that the feeling of the late Commissioner of Patents, General Leggett, is not more friendly to the patent at the present time than it was at the time when it was granted; and he has been called upon by this association of gentlemen to explain his actions. I have read that letter through carefully, and I cannot find, although he is desirous of satisfying these gentlemen of the propriety of his action, that he intimates that he was misled by this alleged fraudulent representation of Woodbury. But he does say *this* in his letter, and it seems to me significant: "The Supreme Court of the District of Columbia had held in several cases that this law, properly construed, made these applications (*i.e.*, these renewed applications), pending cases from the time they were originally filed; and that any public use between that time and the time of finally granting a patent, which was without the consent and knowledge of the applicant, could not be construed as public use in such sense as to prevent the issue of a patent. When this case was called up for my final action, I hesitated for some time as to what action I would take. I knew that the doctrine as laid down by the court would grant the patent." And here he refers, of course, to the doctrine that any public use intervening between withdrawal and renewal could not affect the applicant's right to receive his patent. "I knew that the doctrine as laid down by the court would grant the patent; yet I just as well knew that the patent ought not to be granted. I believed it would not be valid if granted."

I find there is no suggestion in that letter to the effect that he was misled by these declarations of Woodbury; that he had during that long interim been notifying the manufacturers and users of his prospective claims against them.

THE COMMISSIONER'S MISTAKE A BLUNDER.

Another question which was dwelt upon as great at length by my brother Thurston yesterday, and with great force, too, considering the nature of the question, was an alleged *mistake* committed by the commissioner in grantingt he Woodbury patent. As near as I can get the idea, the mistake was this: that the law requires the commissioner to consider whether there has been a public use for more

than two years prior to the filing of the application; that in this particular case, the application upon which the patent was granted was made December 5, 1870; that, in point of fact, there was a prior public use of the invention for more than two years; that the Commissioner of Patents evidently did not take cognizance of that fact, and therefore he failed to in his duty. This, they say, was a mistake, an inadvertance, an omission of a certain step in the investigation, which, as a sworn officer of government, he was bound to take.

It seems to me that a sufficient answer to this line of argument is, that it stands as unquestioned law to-day, that the new application connects with the old one; the statute itself even denominates the new one a "renewed application." I say the unquestioned law of the land; for such, we have seen, was the decision of the Supreme Court of the District of Columbia in the Gray case, and no court has yet pronounced that decision to be inaccurate in any respect.

Now, if that be so, the only prior public use which the commissioner was bound to take cognizance of, was that which preceded the filing of the first application. That was the view of the Supreme Court in the Gray case; for the record in that case shows, most conclusively, that during the ten years preceding the filing of the second or renewed application, there had been a large public use, 400,000 pencils being made and sent out annually by a single firm, and three other firms making and sending out annually not less than 2,000,000. Those facts were upon the record and could not have been overlooked; and yet the court held that two years' public use prior to the filing of the renewed application could not operate as a statutory bar. That was the law under which the commissioner was acting, and he knew that he was bound to apply the law, thus declared by an appellate judicial tribunal, to the Woodbury case, then in hand; and, applying it, what right would he have to raise the question, whether more than two years prior to December 5, 1870, there had been a public use of the invention? His inquisition was, whether, the later application connecting with the earlier, there had been a public use of more than two years prior to the filing of the first application.

I had proposed to say much more on this point; but it seems to me, that the suggestions already made cover the whole ground.

PATENT AUTHORITIES QUOTED.

But, they say, admitting that Mr. Woodbury was the real inventor of the improvement, still he put it into public use more than two years before he made his application, and therefore the statutory bar should operate against it.

Unquestionably Mr. Woodbury had the improvement in experimental use prior to June 3, 1846; but the courts have never yet held, and they never will hold, that an experimental use for the purposes of testing or perfecting an invention, is a "public use," even though the experiment be made in public. I could refer you to numerous authorities upon the subject, but it will suffice to read the summary of the decisions as given by Curtis in his excellent treatise upon patents. He says: "Where a party practises his invention himself, for the purposes of experiment or completion, before he takes out a patent, the inference that he intends to surrender his invention to the public does not arise; and consequently a dedication cannot be proved by evidence that shows only experimental practice by the inventor, whether in public or in private. Indeed, it may be stated as a general test in cases of supposed dedication through the using, exercising or practising the invention, by the patentee himself, previous to his application for a patent, that wherever the evidence stops short of proving such a use, exercise or practice for the purpose of gain, a public use will not be proved."

The Court of Common Pleas in England has gone still further, and ruled that an experiment performed in the presence of others, which not only turns out to be successful, but actually beneficial, in the particular instance, is not necessarily a publication, so as to constitute a gift of the invention to the world. And, again, "Mere forbearance on the part of an inventor to apply for a patent during the progress of experiments, and until he has perfected his invention and tested its value by actual practice, affords no just grounds for the presumption that the inventor intends to abandon his invention or

surrender and dedicate it to the public." (Curtis, 4th ed., § § 389, 389*a*.)

THE "PRIOR USE" ARGUMENT ANSWERED.

Now, was this invention of Mr. Woodbury fully reduced to practice, and the experimental use ended prior to the 3d day of June, 1846? These gentlemen say that the invention was so far developed that in April of 1846, Mr. Woodbury was making sales of machines; and they bring the affidavits of Leonard and of Greene, of New Bedford, to prove that in that month they entered into contract with Woodbury for two machines, after having seen him working with a machine in successful operation.

But other affidavits from the same men tell us that the machine which Woodbury then had did not work successfully; that there was a difficulty about it. What was the difficulty, sir? Now you will be able to appreciate the significance of that change in the lags to which I called your attention when explaining the models. When Leonard and Greene first visited him, Mr. Woodbury was using an Andrews machine which had the smooth wooden lags. These were sufficient upon such a machine. They would have answered upon a Woodworth machine; in fact, upon any class of machines where the holding-down work was effected by means of rollers or their equivalent, because the work would be drawn in by the rotation of the roller, and it was not essential under those circumstances that the surface of the lags or of the rollers should be made corrugated or fluted; but when he took off the rollers and substituted a stationary bar, the work was found to slip upon the smooth wooden lags, and was not readily carried through; and he discovered in the course of his experiments, but at what time we do not know, — it was subsequent, however, to the date when Leonard and Greene visited his establishment, — that, if he used the bar in lieu of the roller, he must change the mechanism of the machine in other particulars. He found it necessary to adopt these fluted lags instead of the smooth ones, because these would have a greater hold upon the work, which now required it in consequence of the substitution of the bar for the roller.

Now Leonard and Greene never saw Mr. Woodbury using a machine in its perfected condition; for they tell us that there was this difficulty in the machine, and that Mr. Woodbury said that he thought he would be able to remedy it. *When* he did remedy it does not appear in the proofs offered by the relator, although the burden of proof in this regard is upon him, and therefore his allegation that the invention was in public use more than two years prior to the application falls to the ground.

LEGAL OPINIONS AND DECISIONS.

My attention has just been called by my associate to an extract from the decision of Judge Fisher, in passing upon the appeal of John W. Cochran, to which I have already referred, and which came before him a few months prior to the passage of the law of 1870. The extract is in these words: "In my opinion, the spirit of our patent laws, and indeed their letter, simply requires an inventor, when he has discovered something which is novel and useful in the arts, to divulge to the world, through the medium of the Patent Office, the nature and character of his invention; and, having done so, a right has accrued to him to have his letters patent for that invention upon the payment of the price stipulated by the law; which right, when once accrued, is not barred by any act of limitation."

Now, the practice of the office for twenty years prior to that date had not been in conformity with those views. But in November, 1869, Judge Fisher, on hearing this appeal from the Commissioner of Patents, laid this down as the law. Subsequently to the passage of the act of 1870, the Supreme Court, considering the appeal of Joshua Gray, reiterated this doctrine as constituting the essence of the proviso in section 35 of the new act, which is the act that must control the question of abandonment as connected with Mr. Woodbury's invention.

In his letter of instructions to the District Attorney in the Sturdevant case, the Attorney General said, "When Sturdevant's patent was issued, the question, as to the novelty of the invention claimed by him, was expressly decided by the Commissioner of Patents, and upon the re-issue of the patent, another decision of the same kind

was made. I am now called upon by the relator, upon the allegation that there was no novelty in said invention, to proceed in the courts for the purpose of reversing these decisions. To allow this, would be practically to give an unsuccessful party objecting to a patent the right to appeal to the courts, and would seem also to put one department in the attitude of attacking the acts of another department of the government.

. . . . . .

"Taking a case like the one before me, in which the question is as to the novelty of the alleged invention, I have determined that where the commissioner withholds his consent to a suit in the name of the Attorney General, to vacate a patent issued by him, such suit ought not to be brought until the validity of the patent in question has been denied, or at least gravely doubted in a judicial proceeding between private parties."

The Attorney General's letter of instructions proceeds, "Exceptions to the rule may be permitted, where persons, alleging a want of novelty in the patent, infringe it, and the patentee delays suit with a view to allowing a large claim for damages to accrue."

AN OPPONENT WANTED — NAME YOUR MAN.

Are the owners of the Woodbury patent delaying suits for any such purpose as this? Are the owners of this patent delaying suits for any purposes whatsoever? Are these substantial, experienced business men so little sagacious that they think they can profit by such manipulation of a patent — by waiting and relying upon the accumulation and collection of damages? It is a most preposterous proposition. The treasurer of this company has been for years the manager of a large manufacturing concern based upon patents, and his large experience and wisdom are enough to give tone to the whole policy of the company. A patent is never valuable unless it be used in a natural way; that is to say, unless it be used for the purpose of controlling the manufacture and the sale and the use of the patented goods, and not by way of collecting damages for past infringements. The latter is but an incident and seldom pays. This company is bringing suits in good faith, and with the earnest desire of testing

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the question of the validity of the patent at the earliest day; and we to-day propose to this relator that he may select any one of his customers in Massachusetts who has pluck enough to stand up and fight — with all the aid that you can give him [turning to Mr. Gould] and the aid of your powerful combination behind you, and we will bring suit against the man you name without delay; and doubtless you can make selection of a man who cannot be "bought off."

I thus have gone over the various questions involved in this controversy. If your honor will indulge me a few moments longer, I will refer *seriatim* to the reasons, as stated in the petition of the relator, why your interposition against this patent is sought.

MR. GOULD PRESENTS TWELVE REASONS. (?)

The first is, "fraudulent misrepresentation." I have already dwelt sufficiently upon that. The charge proves to be utterly groundless.

The second is, that the device covered by the patent was in use more than two years prior to the original application. We have seen that the only use of the device prior to July 3, 1846, was of a purely experimental character.

The third is, that Mr. Woodbury had the invention on sale as early as March 28, 1846. But this, as we have seen, was before the invention had peen reduced to practice — before it was made.

Fourth, that the patantee and the company refuse to bring a suit, &c. This, simply, is not true.

Fifth — "Because this proceeding under *scire facias* works no hardship to the patentee, or the owners of said letters patent, but gives the thousands of users of planing and moulding machines an opportunity to learn at an early day whether they are or not liable for royalty or damages by reason of using the pressure bars covered by the letters patent." Surely, a reason which comes with marvellous good grace from a man who is not shown to be injured in the slightest by the existence of this patent; a man, too, who struggles with seeming desperation to prevent the users of machines from accepting generous and reasonable compromise propositions from the owners of the patent; a man who volunteers to become the champion of men whom he evidently regards as idiots and unable to manage

their own business affairs; who insists upon it that the users of these machines ought to plunge into litigation, to ascertain their rights, when in fact these same users are coming forward and paying the company manfully all the dues which are claimed; and who denounces the compromise, so gladly accepted by hundreds, as "an outrage."

THE COMMISSIONER'S LETTER DICTATED BY PERSONAL FEELING.

Sixth, it is contended that there was an inadvertance, a mistake, an error, on the part of the Commissioner of Patents in granting this patent, because it did not appear to him that the claimant was justly entitled to his patent. In support of this position they quote that curious and most singular letter of General Leggett, written at the time the patent was passed for issue, and which is found in the files of the case. "Because it did not appear to him." To whom, sir? The Commissioner of Patents, or M. D. Leggett? What is that letter? "Your application has been passed for issue in opposition to the judgment of the Examiner, of the Board, of Examiner-in-chief, and the Commissioner of Patents." In opposition to the commissioner's judgment? In conformity to his judgment; for the commissioner reasoned with himself as follows: "I must issue that patent. It is my judgment that the patent should go out, and I have no alternative but to sign and seal it." If for "judgment" in the commissioner's letter, we were to read "personal feeling," the statement would be correct.

It is a source of deep regret to me that General Leggett — for it was the action of the individual, and not of the officer — should have permitted himself to be betrayed into writing such a hasty and ill-advised letter. He told me beforehand that he was in duty bound to issue the patent, but that he should not send it out without a protest; and when he told me what the substance of his endorsement or communication was to be, I remonstrated with him — not that it would or could injure the patent, not that this extra official action could in any respect affect the validity of the grant, but simply because of the reflex influence of the act upon him as an individual.

On his own account, being a man whom I highly esteemed, I hoped he would refrain from committing such a senseless act.

But, sir, the letter of General Leggett, instead of making against us, is the strongest evidence the company can have that every question connected with the investigation before the commissioner was most thoroughly and exhaustively considered. If this public officer so far allowed his personal feelings to be enlisted in the work before him as to step out of the line of his duty and perform an act like this, you may be certain, sir, that he did not grant the patent until he had exhausted every mode of opposition to it. That letter stands to-day as evidence in our favor, and of the strength of the patent under which we are making our mild demands upon the public.

A MISAPPREHENSION.

Seventh. This reason or ground of petition must certainly have been drawn under a misapprehension of the record. This branch of the petition sets forth that "The question of abandonment was decided by the Patent Office, upon the application of the said Woodbury, adversely to him, and he was held to have abandoned his invention as a fact, by the decision of the Patent Office, made and rendered on the 11th day of May, 1872; and said decision was never reversed by the Commissioner of Patents nor by any appellate tribunal, but is still in force as the official judgment of the Commissioner of Patents."

Well, sir, the fact is, that on the 11th day of May, 1872, the examiner who had this matter in charge did write an official letter, in which he rejected the application upon the ground of abandonment. Subsequently that letter of rejection was taken, on appeal, to the Commissioner of Patents, and the commissioner endorsed upon it as follows: "The Supreme Court of the District of Columbia having surrendered [as it is printed here I think it means reversed], the position taken by the commissioner in the Gray *vs.* Hale case [this case] must be considered on its merits."

The purport of the examiner's letter was: As you have abandoned your application for the patent, I will not consider the case on its merits; that is, I will not inquire into the novelty of the invention.

But the Commissioner of Patents, when the matter was appealed to him, said that the question of abandonment was practically settled by the action of the Supreme Court of the District of Columbia in the case of Gray *vs.* Hale, and accordingly he ordered the examiner to proceed with this case as if there were no question of abandonment involved, and to decide upon its merits; in other words, the commissioner then and there decided the question of abandonment favorably to the applicant. The examiner endorsed upon the back of the paper containing the commissioner's order, as follows: "This paper contains an order from the commissioner to examine the application upon its merits." I am astonished that gentlemen of such astuteness as the counsel on the other side should have attempted to make this point in their application.

OTHER REASONS ANSWERED.

The eighth ground upon which the petition proceeds is, that the invention was in public use for more than two years before the 5th day of December, 1870.

This, of course, is based upon the theory that there is no connection between the earlier and the new application, which theory, we have seen, is not in accordance with law.

The ninth and tenth grounds are defective for the same reason as the last.

The eleventh reason is, "because said alleged invention of Woodbury, for which he procured letters patent, was abandoned by him before his application for such letters patent, and because he concealed from the commissioner acts and conduct of his in the premises which constituted such abandonment."

Of course that proceeds altogether upon a misapprehension of what *abandonment* is. And as to this alleged concealment by Mr. Woodbury, it does not appear that he has concealed anything; on the contrary, he revealed everything that was necessary originally to place the application before the office, or necessary to reinstate it after withdrawal, and, therefore, there was no concealment of any fact whatsoever which the law demanded of him.

"And because he represented falsely to the commissioner that he

was without means to prosecute his application for said patent between 1852 and 1870."

I fail to find in the record any such representation by Mr. Woodbury.

"And because he falsely represented to the commissioner that he had always asserted his right to, and warned others against, using or making or vending said invention."

I have shown that this representation by Mr. Woodbury was utterly immaterial; interjected into his affidavit; and, if not true literally, it is unquestionably true in substance. Mr. Woodbury had made repeated declarations as to his intentions to maintain his claim to a patent upon the invention; and I apprehend, though that is not in proof, that it was generally understood among the manufacturers and mill owners in Boston and vicinity that he intended to get a patent upon his invention.

THE PUBLIC NOT TO BE OPPRESSED.

Twelfth. Mr. Gould alleges that "it will operate greatly to the prejudice, injury, annoyance and vexation of a large and important industrial interest in the United States, if said letters patent are not repealed and cancelled."

I have endeavored to show to your honor that there is no danger of that. I have endeavored to show to your honor that it is the interest of this company to make their charges so reasonable that the users of planing machines will not be driven back to the Woodworth feed roller.

When the oppression upon the public is to arise — assuming that we have any right to this invention — it is impossible for me to conceive. Of course, if we have no right to the invention at all, if Woodbury stole it from somebody else, or if he has forfeited his rights, then it is oppression upon the public to be taxed in the slightest degree for its use.

But, Mr. Gould says, "Said letters patent are owned by a corporation organized to prosecute parties using planing machines." A most absurd proposition; for these gentlemen know that the com-

pany is organized for no such purpose, but for the purpose of using its property in the ordinary and legitimate way.

AN UNWRITTEN REASON NOT URGED.

Such are the twelve reasons upon which this proceeding is based. To this list there should, possibly, be added a thirteenth — one which does not appear upon the record, but which — through some inadvertance, I am sure — fell from the lips of my brother Thurston in his able argument yesterday. It was a most singular reason to urge, and one which belongs, if I mistake not, to the boomerang order of argument; that is, it will recoil upon those who use it. You were urged, Mr. Solicitor General, to grant this petition because it was said if you refuse it your action will be trumpted from the Atlantic to the Pacific, from Maine to California. What of it! I do not know whether that would be the case or not. But if it were so, what of it! Have we no right, when we gain a triumph in a court, to announce the fact of our victory? Now, this patent is put upon trial here. That is the whole object of this proceeding, to have an investigation here before your honor, as to whether this is a valid patent; and, if you shall be of the opinion that it is not a valid patent, this relator, and the powerful organization behind him, expect that you will exercise your power to crush it; but it does not follow that you ought to exercise your power to crush it, because these men have been foolish and rash enough to begin this proceeding, and because they fear that if they fail in it, the fact will become known to the world, to their detriment. But what injury will accrue to Mr. Gould, I ask, if you do not grant his petition, beyond this: that he will be unable longer to collect the assessments which he is levying upon the owners of machines throughout the country, in aid of his unlawful warfare upon our rights? Do you believe that Mr. Gould and the association of manufacturers which he is supposed to represent are aiding and supporting the defendants in the various infringements suits now pending? And do you believe that they will derive no advantage, in the way of contributions to their treasury, if you should give it as your judgment that they have made such a case here as to warrant you in asking the courts to interpose for the

repeal of our patent? And is not this the real significance of that utterance of my friend Thurston, when he cries out and implores you to interpose here, because, forsooth, if you do not, they will fail in the prime object they had in view — *i.e.*, they will suffer loss of prestige and stand before the world as defeated parties.

PLANING MILL FREEMASONRY.

It is probable that, if you refuse this petition, the planing machine men throughout the country will know it. There is a sort of freemasonry among them, and not a movement can be made on the one side or the other but the news of it flies upon the wings of the lightning from one end of the land to the other; and I can assure you of one thing, that if you refuse this petition, every planing mill owner in the country, within a week's time, will know of it from our adversaries if not from us; and I think I can assure you of one thing else — and that is, if you grant this petition our adversaries will fill the land with their shouts of victory. Do you believe that they will hold their peace and say nothing if you grant this petition? Do you believe that it will not be an incitement to new organizations — that it will not infuse new life and vitality into the old ones and provide them with the sinews of war, with which the more successfully to combat us in any prosecutions which we institute against the men who are now bidding us defiance? That is the real question for you to consider, sir; and it is a most serious and grave question, and should receive most careful consideration.

JOHN T. DREW INTERVIEWED.

One word further. These gentlemen have been kind enough to put in here a voluminous publication coming from the West, and we did not object to its introduction. They put it in bodily; and we have a right of course to use any part of it. What do we find here? A statement made by this veracious editor — responsible, doubtless, for all his statements — of Mr. Drew's explanation of the policy of this opposition which has been fighting our patent. It seems that certain people, dissatisfied with the compromise action of the executive committee of the Planing Mill Defence Association, have inter-

viewed Mr. Drew, the counsel of the committee, to ascertain why he, as such counsel, advised the compromise; and there is a statement of his explanation.

The editor of the "Northwestern Lumberman," in the October number, in giving the particulars of the interview with Mr. Drew, says: —

"Speaking generally upon the compromise and the motives actuating the committee and himself in making the same, he [Drew] said, in effect, that while, *prima facie*, their case against the Woodbury Company was a strong one, he in reality knew that it could not and would not stand the test of a trial. It had been the policy of the counsel for the defence to make the strongest possible show of a fight, with the intention of forcing the Woodbury Company to a compromise upon the best possible terms for his clients. The point at issue was to prove that the pressure bar device had been in use for more than two years previous to the first application of J. P. Woodbury for a patent upon it, the establishment of which would, of course, render the patent invalid upon the ground of procurement by fraud. This point, while being made in the argument before the Attorney General to appear as absolutely gained, Mr. Drew now says would surely have been lost had the case actually been brought to trial, and the evidence in support of the prior usage of the device been subjected to the searching cross-examination certain to ensue. He states, in substance, that he was really in possession of no valid evidence in support of this point, although professing such to be the case; or, in other words, various affidavits setting forth the fact that pressure bars had been used as early as April, 1846, were found upon investigation to be incorrect. In fact, when the argument was being made, Mr. Drew states that he had in his possession proof positive that the same machines referred to in the affidavits were not sold until August and October, 1846, which would bring the time within two years previous to the application for a patent. Upon this showing of the case Mr. Drew says it was decided by the National Executive Committee to effect a compromise, and by this committee the articles of agreement, substantially as adopted, were prepared in memorandum and passed over to him (Mr. Drew) to be drawn up

in due form. He further states that the compromise proposition was submitted to Mr. Lyman Gould, and met with that gentleman's approval. Mr. Drew says he has not only verbal proof upon this point, but a letter from Mr. Gould to Mr. Crapo, in which he expressed his approval of the same in unmistakable terms."

A SUGGESTION WRONG IN FACT.

Now, the suggestion is made that, at the time of making this damaging explanation, Mr. Drew was the agent of the Woodbury Company. I am not aware that such was the case; and Mr. Whittier, who is far more conversant with the affairs of the company than I am, says that he is not aware of it. It is a fact that the effect of the combination has been just what Mr. Drew declares it was designed to be; viz., to force the company into a compromise; and the adroitness with which Mr. Gould's counsel now avoid most of the question involved in the controversy would seem to suggest that they are no more confident in the intrinsic merits of their case than Mr. Drew has been from the very inauguration of this wicked and blackmailing scheme.

THE CONCLUSION.

In conclusion, I trust that your honor will not lose sight of the fact that the Woodbury Patent Planing Machine Company is in the hands of able business men, upright and sagacious; and that, since its affairs have been under their present management at least, there has been no disposition manifested to oppress the public by extravagant demands. The company is simply asking for the protection of its legitimate rights. It is for its interest to make reasonable and only reasonable demands. We stand ready to put our cause in suit, where its merits can be thoroughly tested, as soon as the necessity therefor arises. We have already commenced suits; and we make to-day a proposition to this relator that we will commence suit against any man whom he may select, under the conditions which I have already indicated. We cannot believe that your honor is ready to make a precedent which is going to throw a cloud over every patent that issues under the seal of the Patent Office of the United States,

and which will quadruple the business of this department by converting it into a *quasi* appellate tribunal from the decisions of the Commissioner of Patents.

THE DISMISSAL OF THE SCIRE FACIAS.

The full decision of the Solicitor General, S. F. Phillips, in this *scire facias* proceedings, rendered in favor of the Woodbury Patent Planing Machine Company, is as follows: —

WASHINGTON, November 5, 1875.

In the matter of a petition by Lyman Gould, for leave to file a bill to vacate letters patent No. 138,462, to Joseph P. Woodbury, &c.

The above matter stands upon a different state of facts from that made on the *ex parte* application heretofore heard by Attorney General Williams. The original petition has also been amended.

1. It appears now that suits have recently been brought by the parties holding the patent, against persons who have infringed it. Two of these have subsequently been arranged upon the basis, amongst other things, of acknowledging the validity of the patent. Two others are still pending. Apparently these suits have been brought in good faith, and will be so prosecuted. Suggestions have been made to the contrary; but it is obviously impracticable for this department to act upon such suggestions in cases presenting the ordinary *indicia* of good faith. It must be assumed, I think, that in the course of suits now pending, or which, in consequence of the temper which led to them, will soon be brought, parties interested to invalidate the patent will have a fair opportunity of so doing.

2. Upon the allegation that the patent was obtained by a fraud upon the Patent Office, or in consequence of a mistake by that office, the case is as follows: —

(*a*) The Commissioner of Patents reports that there is no evidence of such fraud or irregularity in the records of that office, and that the fact that the issue was accompanied by a sort of protest on the part of the commissioner, does not warrant proceedings of the kind asked for by the petitioner Gould.

As regards the protest above alluded to, it seems that the com-

missioner issued the patent against his own personal judgment, in deference to a decision made by his superiors in Gray's case, which he supposed to govern that before him.

If such decision did govern that case, of course the protest was, for any purpose to which it can be cited here, merely idle.

It is said, however, that the decision cited did not govern the case, and therefore that the issue of the patent was by mistake, within the meaning of that word as used to define one of the events in which a *scire facias* is to be allowed.

It is not for every mistake committed by the commissioner in adjudicating upon a claim for a patent, that a *scire facias* will be allowed. Most of such mistakes will be left to the correction of courts in the course of ordinary suits for infringing the patents granted. For instance, if, in the Woodbury application, the commissioner found a state of facts which were just what those of the Gray case had been, his mistake thereabouts (supposing there were such) would ordinarily be left to be corrected in the course of private suits between the patentee and the persons violating his supposed rights. It does not appear that such is not the case here. The commissioner was competent to find the facts. He stated in effect that he found them substantially those in Gray's case. Some reason is alleged to show that he erred in this conclusion. Possibly he did; but I need not go into that, unless it appears to have been a gross mistake. If there be, as here, something material to be said upon both sides, the question may be left to the results of ordinary litigation.

(*b*) The main specification as to fraud outside of the record is, that Woodbury, in the course of his application, made oath before the commissioner that "whenever he had seen or had knowledge that any party or parties were making or using said pressure bar," &c., "he promptly notified them that it was his invention," and that "he should hold them responsible," &c.

Affidavits have been filed going to show that in some instances he had not done so.

What is material about Woodbury's affidavit is the suggestion that he had not abandoned his invention. In order to show that, it was

not necessary to show that he had threatened every individual who was using the bar. So that his threats were such in number and seriousness as naturally to produce an impression upon the community that he was maintaining his claim, his having failed to notify all was a matter of indifference.

I do not know that he did even that. It may be that he did not. That is not the question here. I am considering whether evidence that Woodbury allowed certain users of his pressure bar to go unwarned, shows that he swore substantially falsely in making an affidavit whose material object was disproof of a suggestion of abandonment, but which in form asserted that he had warned everybody.

I think that such a degree of untruthfulness (admitting it to have existed) is not fraud, and that is the only degree shown by the proofs in this petition.

It seems to be unnecessary to discuss the point made as to the untruthfulness of Woodbury's allegation, in the same connection as to his poverty.

I may add that this matter has been argued before me very forcibly, and with great elaboration. In the course of the argument it has been asserted that the act of 1870 does not allow of a patent under the extraordinary facts of this case, viz., an original application in 1848, a rejection soon after, and a withdrawal in 1852, or at least 1854, followed by a very general public use of the bar, until December, 1870, when the application was renewed.

It is understood in intelligent circles that the Supreme Court of the District of Columbia has decided otherwise. This understanding may be an error, or the decision itself may be erroneous. If so, it can be shown in the course of ordinary litigation. In the mean time it can hardly be said that the error is so glaring as to require this department to set upon foot extraordinary proceeding for its correction.

Upon the whole, I am of the opinion that the proceedings now pending in the nature of a *scire facias* to repeal Patent No. 138,462, heretofore issued to Joseph P. Woodbury, should be dismissed.

S. F. PHILLIPS,
Solicitor General.

DEFENDANT'S EXHIBIT Bp. — D.B.H., Special Examiner.

CERTIFIED COPY OF CERTIFICATE OF INCORPORATION OF THE WOODBURY PATENT PLANING MACHINE COMPANY.

[PUT IN EVIDENCE, PAGE 416, VOL. 1.]

STATE OF CONNECTICUT,
OFFICE OF SECRETARY OF STATE.

THE WOODBURY PATENT PLANING MACHINE CO.

To all persons to whom these Presents may come:

The undersigned, being the president and all the directors of the Woodbury Patent Planing Machine Company, a corporation organized under the statute laws of the State of Connecticut, regulating the formation of joint-stock corporations, and located in the town and County of Hartford and State of Connecticut, in pursuance of said statute laws, hereby certify as follows; to wit, —

First. The purpose for which said corporation is formed is the following; to wit, —

To own and hold certain letters patent, granted to Joseph P. Woodbury by the United States, for a new and useful improvement in planing machines, dated April 29, 1873, and numbered 138,462, or any re-issues or extensions of the same; also any and all other letters patent which are now or hereafter may be granted for planing machines or improvements thereof, or re-issues or extensions of the same; to manufacture and sell planing machines constructed according to said patents and the specifications thereof. To dispose of rights and grant licenses under said patents, and to collect royalties or other compensation from all persons now making, using or vending said patented inventions, or who have heretofore made, sold or used them, or may hereafter make, use or sell the same during the term of said patents, and to buy, sell, own and deal in any real estate or personal property, necessary or convenient for the prosecution of

said business, and generally to do all things incidental to said business, and to the proper management thereof.

Second. The amount of their capital stock is four million dollars.

Third. The amount of their capital stock actually paid in is nothing.

Fourth. The names of their stockholders, and the number of shares by each respectively owned, is as follows; to wit, —

Names of Stockholders.	Number of Shares.
Waldron H. Rand	40,000
Lucius A. Bigelow	20,000
Sidney C. Bancroft	20,000

And in further pursuance of said statute laws we cause this certificate to be deposited with the secretary of this state, and a duplicate thereof with the town clerk of the town of Hartford, in which said corporation is to transact its business.

Dated at Hartford this twenty-fourth day of December A.D. 1873.

LUCIUS A. BIGELOW,
President.

LUCIUS A. BIGELOW,
WALDRON H. RAND,
SIDNEY C. BANCROFT,
Directors.

STATE OF CONNECTICUT, }
COUNTY OF HARTFORD. } HARTFORD, December 24, 1873.

Then and there personally appeared Lucius A. Bigelow, Waldron H. Rand and Sidney C. Bancroft, being the president and all the directors of the Woodbury Patent Planing Machine Company, and made oath to the truth of the foregoing certificate signed by them.

Before me,

CHAS. E. PERKINS,
Justice of the Peace.

Received and filed December 26, 1873.

STATE OF CONNECTICUT, ss.

OFFICE OF SECRETARY OF STATE.

I hereby certify that the foregoing is a true copy of record in this office.

In testimony whereof I have hereunto set my hand and affixed the [SEAL] seal of said state, at Hartford, this twentieth day of June A.D. 1876.

M. H. SAWYER,
Secretary of State.

DEFENDANT'S EXHIBIT Bo.— D.B.H., Special Examiner.

CERTIFIED COPY FROM THE PATENT OFFICE OF THE UNITED STATES, OF THE AFFIDAVIT OF JOSEPH P. WOODBURY IN THE MATTER OF THE EXTENSION OF THE LETTERS PATENT GRANTED JOSEPH E. ANDREWS, NOVEMBER 21, 1845.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

THE U. S. PATENT OFFICE,

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy, from the files of this office, of the affidavit of Joseph P. Woodbury, in the matter of the application for extension of letters patent granted Joseph E. Andrews, dated November 21, 1845, No. 4283, for planing and jointing machines.

In testimony whereof I, Ellis Spear, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto [SEAL] affixed, this seventh day of February in the year of our Lord one thousand eight hundred and seventy-six, and of the independence of the United States the one hundredth.

ELLIS SPEAR,
Acting Commissioner.

In the matter of the application of John M. Farcer, administrator of the estate of Joseph E. Andrews, deceased, for an extension of the United States letters patent granted to said Andrews, for an improvement in planing machines, dated November 21, 1845.

BEFORE THE HONORABLE COMMISSIONER OF PATENTS.

Joseph P. Woodbury, being duly sworn, doth depose and say: I am forty-three years old; I now reside in the town of West Roxbury in the County of Norfolk and State of Massachusetts; I have resided in Boston a part of the time for the last fourteen years, and have been constantly engaged in mechanical business in the city of Boston for the last fourteen years. I am the patentee of the patent granted to me March 20, 1849, for an improvement in planing machines; I have been almost constantly engaged in the making and using of the various kinds of planing machines from the year 1844 to the year 1856; I was well acquainted with the late Joseph E. Andrews, the patentee of an improvement in planing machines, granted to him November 21, 1845; I was acquainted with the said Joseph E. Andrews previous to his obtaining his patent, and afterwards until his decease; I saw his first model and first machines, and conversed with him frequently about them; I have had great opportunity to become well acquainted with all the various kinds of planing machines that have been in use in the United States for the last fifteen years. I have had several suits at law and equity litigated, concerning patents for planing machines, within the last fifteen years, and in most of those cases, planing machines, and letters patent for planing machines, were examined. I have also examined all patents for planing machines in the Patent Office at Washington, and also about all of the rejected applications for improvements in planing machines in the Patent Office prior to March 20, 1849, and I can clearly say that I have never seen anything either in the Patent Office or machines out of the Patent Office, that would in the least degree impeach the novelty of the invention set forth in said Joseph E. Andrew's patent. I am acquainted with all of the heirs at law of said Joseph E. Andrews, and know that they are quite poor and destitute, and if the aforesaid patent was extended for another

term it would afford them important material aid. I consider said patent a valuable invention, and know that said Andrews has not been properly remunerated for said invention, but not in consequence of any want of effort or neglect on his part, but in consequence of circumstances over which he had no control. I know that for some time before and after he obtained his said patent he was extremely poor, in want of the necessaries of life and obliged to borrow small sums of money to support himself and his family from day to day.

JOSEPH P. WOODBURY.

Boston, August 24, 1859.

Subscribed and sworn to this day by said Woodbury, before me,

C. P. CURTIS, Jr,

Ex'd. — J.R. *U. S. Commissioner.*

DEFENDANT'S EXHIBIT Bn. — D.B.H., Special Examiner.

Certified copy of Deed of Samuel Hall to Joseph P. and James A. Woodbury, dated January 14, 1846, of Land in East Boston.

[Put in Evidence, Page 417, Vol. 1.]

Hall to Woodbury *et al.*
Lib. 556, fol. 271.

Know all men by these presents, that I, Samuel Hall, of Boston in the County of Suffolk and Commonwealth of Massachusetts, shipwright, in consideration of twelve hundred dollars to me paid by Joseph P. Woodbury and James A. Woodbury, both of Boston in the County of Suffolk and commonwealth aforesaid, housewrights, the receipt whereof is hereby acknowledged, do hereby give, grant,

bargain, sell and convey unto the said Joseph P. and James A. Woodbury, their heirs and assigns, a certain tract or parcel of land or flats situate in that part of Boston aforesaid called East Boston, bounded, described and measuring as follows; viz., beginning at a point in section two, where the southwesterly line of Decatur street produced would meet the northwesterly line of Border street, and running thence northwesterly at right angles with said Border street to the channel, or as far as the law allows; thence running northeasterly, and bounded northwesterly by the channel, or by a line as far northwesterly as the law allows, one hundred and ninety feet; thence running southeasterly, and bounded northeasterly by a line parallel to the first-mentioned boundary line, and distant throughout one hundred and ninety feet therefrom, to Border street; thence running southwesterly and bounded southeasterly by Border street, one hundred and ninety feet, to the point of beginning; reserving, however, to said Hall the right of draining through the granted premises. The described premises are shown opposite to lots numbered 306 and 307 on a plan called "Section Two, East Boston," made by R. H. Eddy, dated November 1st, 1838, and recorded with Suffolk Deeds; and this conveyance is made on the express condition that no ferry shall ever be established or maintained between any portion of the premises and any other place whatever. The above-described premises are the same conveyed to said Hall by the East Boston Company, by deed dated March 7th, 1845, and recorded with Suffolk Deeds, lib. 542, fol. 232, and are subject to a mortgage to said East Boston Company, executed by said Hall, March 7th, 1845, as security for a note of even date therewith, signed by the said Hall, for thirty-eight hundred dollars, payable to said company in five years from the date thereof, with interest semi-annually at the rate of six per cent per annum, which note and interest the said J. P. and J. A. Woodbury agree to pay when due, and to cause said mortgage to be duly cancelled. To have and to hold the above-granted premises, with the privileges and appurtenances thereto belonging, to the said Joseph P. Woodbury and James A. Woodbury, their heirs and assigns, to their use and behoof forever. And I, the said Samuel Hall, for myself and my heirs, executors and administrators, do

covenant with the said Joseph P. and James A. Woodbury, their heirs and assigns, that I am lawfully seised in fee of the aforegranted premises; that they are free from all incumbrances except as aforesaid; that I have a good right to sell and convey the same to the said Joseph P. and James A. Woodbury as aforesaid; and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said Joseph P. and James A. Woodbury, their heirs and assigns forever, against the lawful claims and demands of all persons.

In witness whereof I, the said Samuel Hall, and Huldah B. my wife, in token of her relinquishment of all her right of dower in the above-described premises, have hereunto set our hands and seals, this fourteenth day of January in the year of our Lord eighteen hundred and forty-six.

SAM'L HALL. [SEAL]
HULDAH B. HALL. [SEAL]

Signed, sealed and delivered in presence of us; the words "five thousand" erased, and the words "twelve hundred" interlined first before signing.

JOHN ATKINS.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. JANUARY 27, 1846.

Then personally appeared the above-named Samuel Hall, and acknowledged the above instrument to be his free act and deed.

Before me, JOHN ATKINS,
Justice of the Peace.

January 28, 1846, at ten o'clock A.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records for Suffolk County, lib. 556, fol. 271.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bm.—D.B.H., Special Examiner.

CERTIFIED COPY OF MORTGAGE FROM JOSEPH P. AND JAMES A. WOODBURY TO SAMUEL HALL AND EDWARD H. DELANO, AND CERTIFIED COPY OF THE DISCHARGE OF SAID MORTGAGE BY SAID DELANO AND THE NORTH AMERICAN INSURANCE COMPANY, ASSIGNEE OF SAMUEL HALL.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

WOODBURY *et al.* to HALL *et al.*
Lib. 556, fol. 272.

Know all men by these presents, that we, Joseph P. Woodbury and James A. Woodbury, both of Boston in the County of Suffolk and Commonwealth of Massachusetts, housewrights, in consideration of twelve hundred dollars to us paid by Samuel Hall and Edward H. Delano, both of Boston in the County of Suffolk and commonwealth aforesaid, shipwrights, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Hall and Delano, their heirs and assigns, a certain tract of land or flats situate in that part of Boston aforesaid called East Boston, bounded, described and measuring as follows; viz., beginning at a point in section two, where the southwesterly line of Decatur street, produced, would meet the northwesterly line of Border street, and running thence northwesterly at right angles with said Border street to the channel, or as far as the law allows; thence running northeasterly, and bounded northwesterly by the channel or by a line as far northwesterly as the law allows, one hundred and ninety feet; thence running southeasterly, and bounded northeasterly by a line parallel to the first-mentioned boundary line, and distant therefrom one hundred and ninety feet throughout to Border street; thence running southwesterly, and bounded southeasterly by Border street, one hundred and ninety feet, to the point of beginning; reserving, however, to the said J. P. and J. A. Woodbury the right of draining through the

granted premises. The above-described premises are the same conveyed to us by said Hall, by deed bearing even date with these presents, and this conveyance is made upon the express condition that no ferry shall be established or maintained between any portion of the premises and any other place whatever. And the above-granted premises are subject to a mortgage to the East Boston Company, executed by said Hall, March 7, 1845, as security for a note of even date therewith, signed by the said Hall, for thirty-eight hundred dollars, payable to said company in five years from the date thereof, with interest semi-annually at the rate of six per cent per annum, which note and interest the said J. P. and J. A. Woodbury agree to pay when due, and to cause said mortgage to be duly cancelled. To have and to hold the above-granted premises to the said Samuel Hall and Edward H. Delano, their heirs and assigns, to their use and behoof forever. And we, the said Joseph P. Woodbury and James A. Woodbury, for ourselves and our heirs, executors and administrators, do covenant with the said Hall and Delano, their heirs and assigns, that we are lawfully seised in fee simple of the aforegranted premises; that they are free from all incumbrances except as aforesaid; that we have good right to sell and convey the same to the said Hall and Delano, their heirs and assigns forever as aforesaid, and that we will and our heirs, executors and administrators shall warrant and defend the same to the said Hall and Delano, their heirs and assigns forever, against the lawful claims and demands of all persons. Provided, nevertheless, that if the said J. P. and J. A. Woodbury, their heirs, executors or administrators, shall pay unto the said Hall and Delano, their executors, administrators or assigns, the sum of twelve hundred dollars, that is to say, the sum of six hundred dollars to the said Hall, and the sum of six hundred dollars to the said Delano, in ten years from the date hereof, with interest payable annually, at the rate of six per cent per annum, or if said amounts shall be paid within the said ten years, then this deed, as also two promissory notes bearing even date with these presents, signed by the said J. P. and J. A. Woodbury, whereby they jointly and severally promise to pay to the said Hall and Delano, or their order, the said sums and interest at the times aforesaid, shall all be

absolutely void to all intents and purposes. And provided also that until default of the payment of the said sum or interest, or other default as herein provided, the mortgagees shall have no right to enter and take possession of the premises.

In witness whereof we, the said Joseph P. Woodbury and James A. Woodbury, and Harriet E. B., wife of said Joseph P., and Nancy D., wife of said James A., in token of their relinquishment of all their right of dower in the above-granted premises, have hereunto set our hands and seals, this fourteenth day of January in the year of our Lord eighteen hundred and forty-six.

JOSEPH P. WOODBURY. [SEAL]
JAMES A. WOODBURY. [SEAL]
HARRIET E. B. WOODBURY. [SEAL]
NANCY D. WOODBURY. [SEAL]

Signed, sealed and delivered in presence of
JOHN ATKINS,
CAROLINE TUESLEY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. JANUARY 26, 1846.

Then personally appeared the the above-named Joseph P. Woodbury and James A. Woodbury, and acknowledged the above instrument to be their free act and deed.

Before me,
JOHN ATKINS,
Justice of the Peace.

January 28, 1846, at 10 o'clock, A.M.— Received, entered and examined,

pr. HENRY ALLINE, *Reg.*

BOSTON, January 15, 1856.

The North American Insurance Company, by their president, assignees of Samuel Hall, one of the within-named mortgagees, and Edward H. Delano, the other mortgagee within named, acknowl-

edge to have received full satisfaction for the debt thereby secured, and do therefore hereby cancel and discharge the same.

NORTH AMERICAN FIRE INS. CO.,
by ALBERT BOWKER, *Prest.*

EDWARD H. DELANO.
Test, HENRY ALLINE, *Reg.*

A true copy from the Records for Suffolk County, lib. 556, fol. 272.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bk.—D.B.H., Special Examiner.

CERTIFIED COPY OF ASSIGNMENT BY SAID HALL OF HIS INTEREST IN MORTGAGE TO THE NORTH AMERICAN INSURANCE COMPANY.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

HALL to NORTH AMERICAN INSURANCE COMPANY.
Lib. 673, fol. 248 : —

The following is annexed to a mortgage deed from J. P. Woodbury, &c., to S. Hall, &c., dated January 14, 1846, and recorded with Suffolk Deeds, lib. 556, fol. 272 : —

Know all men by these presents, that I, Samuel Hall, of Boston, Mass., one of the mortgagees named in a certain mortgage deed, dated Boston, January 14, 1846, given by Joseph P. Woodbury and James A. Woodbury to said Samuel Hall, to secure the payment of two notes of hand, each for six hundred dollars, dated Boston, January 14, 1846, recorded in Suffolk Registry of Deeds, lib. 556, fol.

272, in consideration of the sum of six hundred dollars received of the North American Insurance Company (established in Boston aforesaid), to be paid by Joseph P. Woodbury and James A. Woodbury, of Boston, aforesaid, in the County of Suffolk and Commonwealth of Massachusetts, the receipt of which is hereby acknowledged, do hereby sell, assign, transfer and set over unto said North American Insurance Company, their successors and assigns, the undivided half part of the said mortgage deed, the real estate therein mentioned, and the promissory notes and debts thereby secured. To have and to hold the same to them, the said North American Insurance Company, their successors and assigns, to and their use and benefit forever; subject, nevertheless, to redemption according to law.

In witness whereof [I], the said Samuel Hall, have hereunto set my hand and seal this twenty-eighth day of November in the year of our Lord eighteen hundred and fifty-four.

SAMUEL HALL. [SEAL]

Executed and delivered in presence of (four words first erased and one word first interlined)

SUFFOLK, ss. BOSTON, Nov. 28 A.D. 1854.

Then personally appeared the above-named Samuel Hall, and acknowledged the above instrument to be his free act and deed.

Before me,

JOHN KUHN,

Justice of the Peace.

December 2, 1854, at twelve minutes past 10 A.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the records of deeds for the County of Suffolk, lib. 673, fol. 248.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bj. — D.B.H., Special Examiner.

CERTIFIED COPY OF THE TRANSFER OF A MORTGAGE ON THE ABOVE PREMISES, FROM SAMUEL HALL TO THE EAST BOSTON COMPANY, MADE TO JOSEPH P. WOODRURY BY THE SAID EAST BOSTON COMPANY, FEBRUARY 28, 1850.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

EAST BOSTON COMPANY to WOODBURY.
Lib. 608, fol. 51.

The following is annexed to a mortgage deed from Samuel Hall to the East Boston Company, dated March 7, 1845, recorded in lib. 543, fol. 218: —

Know all men by these presents, that the East Boston Company, the mortgagee within named, in consideration of thirty-eight hundred dollars paid to the said company by Joseph P. Woodbury, of Boston in the County of Suffolk, the receipt of which is hereby acknowledged, do hereby sell, transfer and assign unto the said Woodbury, all the right, title and interest of the said company in and to the land and premises within described, together with the promissory note within mentioned, and the debt secured thereby. To have and to hold the same to the said Joseph P. Woodbury, and his heirs and assigns, to his and their own use forever, subject only to the right of the within-named mortgagor, his heirs and assigns, to redeem the same.

In witness whereof the said East Boston Company has caused its corporate seal to be hereto affixed, and these presents to be subscribed by William C. Barstow, the treasurer of the said company, thereto duly authorized, this twenty-eighth day of February A.D. eighteen hundred and fifty.

WM. C. BARSTOW, [SEAL]
Treasurer East Boston Co.

Executed and delivered in presence of
GEO. F. WADSWORTH.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. BOSTON, February 28 A.D. 1850.

The above-named William C. Barstow acknowledged the above instrument to be the free act and deed of the said East Boston Company.

Before me,
THOMAS C. AMORY,
Justice of the Peace.

February 28, 1850, at 34 minutes past 3 o'clock P.M. —Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 608, fol. 51.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bi. — D.B.H., Special Examiner.

CERTIFIED COPY OF WARRANTY DEED OF JAMES A. WOODBURY TO JOSEPH P. WOODBURY OF ALL HIS INTEREST IN THE ABOVE PREMISES, DATED FEBRUARY 25, 1851.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

WOODBURY to WOODBURY.

Lib. 617, fol. 281.

Know all men by these presents, that I, James A. Woodbury, of Winchester in the County of Middlesex and Commonwealth of Massachusetts, machinist, in consideration of ten dollars and other

valuable considerations to me paid by Joseph P. Woodbury, of Lynn in the County of Essex and commonwealth aforesaid, manufacturer, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Joseph P. Woodbury, his heirs and assigns forever, one undivided half part of a certain tract or parcel of land or flats situate in that part of Boston called East Boston in the County of Suffolk and commonwealth aforesaid, bounded, described and measuring as set forth and contained in a deed of the whole of said land and flats to me and the said Joseph P. Woodbury from Samuel Hall, dated January 14, 1846, and recorded with Suffolk Deeds, book 556, page 271, to which reference is made for description. The premises hereby granted being one undivided half part of the land and flats conveyed by said deed, with the buildings thereon, subject to the conditions and incumbrances therein mentioned, and also to one other mortgage for twelve hundred dollars, made by me and the said Joseph P. Woodbury, which he agrees to pay and save me harmless from, and also to one other mortgage made by me to the said Joseph P. Woodbury, for four thousand dollars, which he agrees to discharge in part consideration of this grant; and the said Joseph P. Woodbury also agrees to save me harmless from any liability on account of the mortgage for thirty-eight hundred dollars mentioned in said Hall's deed to us; all which agreements are in part consideration of this grant as aforesaid. To have and to hold the above-granted premises, with the privileges and appurtenances thereto belonging, to the said Joseph P. Woodbury, his heirs and assigns, to his and their use and behoof forever. And I, the said James A. Woodbury, for myself and my heirs, executors and administrators, do covenant with the said Joseph P. Woodbury, his heirs and assigns, that I am lawfully seised in fee of the aforegranted premises; that they are free from all incumbrances, except as aforesaid; that I have a good right to sell and convey the same to the said Joseph P. Woodbury as aforesaid; and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said Joseph P. Woodbury, his heirs and assigns forever, against the lawful claims and demands of all persons.

In witness whereof, I, the said James A. Woodbury, with my wife, Nancy D. Woodbury, who hereby releases all her right of dower in the granted premises, have hereunto set our hands and seals, this twenty-fifth day of February in the year of our Lord eighteen hundred and fifty-one.

JAMES A. WOODBURY. [SEAL]
NANCY D. WOODBURY. [SEAL]

Signed, sealed and delivered in presence of us,
J. GILES,
JOSEPH GAVITT,
to J.A.W.
SAMUEL KENDALL,
to N.D.W.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. BOSTON, February 28, 1851.

Then personally appeared the above-named James A. Woodbury, and acknowledged the above instrument to be his free act and deed.

Before me,
J. GILES,
Justice of the Peace.

February 28, 1851, at 53 minutes past 11 o'clock A.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 617, fol. 281.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bh. — D.B.H., Special Examiner.

CERTIFIED COPY OF MORTGAGE AND OF DISCHARGE OF SAME, MADE BY JAMES A. WOODBURY TO JOSEPH P. WOODBURY, UPON HIS UNDIVIDED INTEREST IN SAID PREMISES, NOVEMBER 15, 1849.

[PUT IN EVIDENCE, PAGE 417, VOL. 1.]

WOODBURY to WOODBURY.

Lib. 606, fol. 71.

Know all men by these presents, that I, James A. Woodbury, of Lynn in the County of Essex and Commonwealth of Massachusetts, in consideration of four thousand dollars to me paid by Joseph P. Woodbury, of Boston in the County of Suffolk and commonwealth aforesaid, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Joseph P. Woodbury, his heirs and assigns forever, all my right, title and interest in and to a certain tract or parcel of land and flats, situate in that part of said Boston called East Boston, bounded, described and measuring as set forth in a deed thereof to me and the said Joseph P., from Samuel Hall, dated January 14, 1846, and recorded with Suffolk Deeds, book 556, page 271, to which reference is made for description; the premises hereby granted being one undivided half part of the land and flats conveyed by said deed, with the buildings thereon, subject to the conditions and incumbrances therein mentioned. To have and to hold the above-granted premises, with the privileges and appurtenances thereto belonging, to the said grantee, his heirs and assigns, to his and their use and behoof forever. And I, the said grantor, for myself and my heirs, executors and administrators, do covenant with the said grantee, his heirs and assigns, that I am lawfully seised in fee simple of the aforegranted premises; that they are free from all incumbrances, excepting the conditions and mortgage mentioned in said deed, and also a mortgage to said Hall for twelve hundred

dollars; that I have good right to sell and convey the same to the said grantee, his heirs and assigns forever as aforesaid, and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said grantee, his heirs and assigns forever, against the lawful claims and demands of all persons. Provided, nevertheless, that if the said grantor, his heirs, executors or administrators, shall pay unto the said grantee, his executors, administrators or assigns, the sum of four thousand dollars in five years from the date hereof, with interest at the rate of six per cent per annum, payable semi-annually, and pay one half the insurance on the buildings upon the premises for the benefit of the grantee and his assigns, until said sum shall be paid in full with interest, then this deed, as also a promissory note bearing even date with these presents, signed by the said grantor, whereby he promises to pay to the said grantee, or his order, the said sum and interest at the times aforesaid, shall each be absolutely void to all intents and purposes. And provided also, that until default of the payment of the said sum or interest, or other default as herein provided, the mortgagee shall have no right to enter and take possession of the premises.

In witness whereof I, the said James A. with my wife Nancy D., who hereby releases all right of dower in the granted premises, have hereunto set our hands and seals this fifteenth day of November in the year of our Lord eighteen hundred and forty-nine.

JAMES A. WOODBURY. [SEAL]

[SEAL]

Signed, sealed and delivered in presence of (the words "from Samuel Hall," were inserted before the execution hereof),

JOHN P. WOODBURY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. DECEMBER 11, 1849.

Then personally appeared the above-named James A. Woodbury, and acknowledged the above instrument to be his free act and deed.

Before me,

DAVID MORGAN, *Justice of the Peace.*

December 11, 1849, at 56 minutes past 9 o'clock A.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Record of Deeds for the County of Suffolk, lib. 606, fol. 71.

Attest, THOS. F. TEMPLE, *Reg.*

[In margin:] Boston, February 21, 1851. I acknowledge to have received full satisfaction for the debt secured by the mortgage here recorded, and do therefore hereby cancel and discharge the same.

JOSEPH P. WOODBURY.

Witness,
JAMES RICE.

DEFENDANT'S EXHIBIT Bg. — D.B.H., Special Examiner.

CERTIFIED COPY OF DEED OF NATHANIEL HAMBLIN TO JOSEPH P. WOODBURY OF REAL ESTATE IN EAST BOSTON, DATED JANUARY 1, 1847.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

HAMBLIN to WOODBURY *et al.*
Lib. 571, fol. 263.

Know all men by these presents, that I, Nathaniel Hamblin, of Boston in the County of Suffolk and Commonwealth of Massachusetts, painter, in consideration of fifteen hundred dollars to me paid by Joseph P. and James A. Woodbury, of Boston aforesaid, copartners in the planing business, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto

the said J. P. and J. A. Woodbury, their heirs and assigns, a certain piece or parcel of land, with the buildings thereon, situated in that of Boston called East Boston, bounded and described as follows; viz., beginning at a point on the northwesterly side of Havre street, one hundred and seventy-eight feet and six inches southwesterly from Porter street; thence running southwesterly on said Havre street, nineteen feet; thence turning at right angles and running northwesterly, fifty feet, on a passageway five feet wide, forever to remain open; thence turning at right angles and running northeasterly on a line parallel with Havre street, nineteen feet; thence turning at right angles and running on a line parallel with said passageway southeasterly, fifty feet, to the point of beginning; with a right, in common with others, to the use of the passageways, and all other appurtenances to the same belonging. This conveyance is made upon condition that the said Joseph P. and James A. Woodbury shall assume and pay a note for nine hundred and thirty-three dollars, with the interest thereon, payable to Sleeper and Carney, and secured by mortgage in the premises hereby conveyed, dated October 1, 1846, running five years from date, and recorded in Suffolk Registry, lib. 568, fol. 249. To have and to hold the above-granted premises to the said J. P. and J. A. Woodbury, their heirs and assigns, to their use and behoof forever. And I, the said Nathaniel Hamblin, for myself and my heirs, executors and administrators, do covenant with the said J. P. and J. A. Woodbury, their heirs and assigns, that I am lawfully seised in fee simple of the aforegranted premises; that they are free from all incumbrances except the mortgage to Sleeper and Carney aforesaid; that I have good right to sell and convey the same to the said J. P. and J. A. Woodbury, their heirs and assigns forever, except as aforesaid; and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said J. P. and J. A. Woodbury, their heirs and assigns forever, against the lawful claims and demands of all persons.

In witness whereof, I, the said Nathaniel Hamblin, together with Eliza A., my wife, in token of her relinquishment of all right of dower in said estate, have hereunto set our hands and seals this

first day of January in the year of our Lord eighteen hundred and forty-seven.

NATH'L HAMBLIN. [SEAL]
ELIZA A. HAMBLIN. [SEAL]

Signed, sealed and delivered in presence of
JOHN ATKINS,
FRANCIS J. HAMBLIN.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. JANUARY 2, 1847.

Then personally appeared the above-named Nathaniel Hamblin, and acknowledged the above instrument to be his free act and deed.

Before me,
JOHN ATKINS,
Justice of the Peace.

January 8, 1847, at 14 minutes past four o'clock P.M. — Received, entered and examined,

pr. HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk lib. 571, fol. 263.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bf. — D.B.H., Special Examiner.

CERTIFIED COPY OF DEED FROM WILLIAM HEATH TO JOSEPH P. WOODBURY AND JAMES A. WOODBURY, OF LAND IN EAST BOSTON, DATED JUNE 14, 1847.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

HEATH to WOODBURY *et al.*
Lib. 579, fol. 162.

Know all men by these presents, that I, William Heath, of Boston in the County of Suffolk and Commonwealth of Massachusetts,

housewright, in consideration of thirty-three hundred dollars, paid *by* me by Joseph P. Woodbury and James A. Woodbury, of Boston aforesaid, mechanics, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Joseph P. Woodbury and James A. Woodbury, their heirs and assigns, a certain piece or parcel of land, with the buildings thereon, situated in that part of Boston called East Boston, bounded, described and measuring as follows; viz., beginning at the corner of Lexington and Marion streets, thence running southwesterly on said Lexington street, twenty feet; thence turning at right angles and running northwesterly by a line through the centre of the partition between the house hereby conveyed and the house adjoining, seventy-six, feet to a passageway four feet wide, forever to be kept open; thence turning at right angles and running northeasterly on said passageway twenty feet to Marion street; thence southeasterly on said Marion street seventy-six feet to the point first begun at, with the right of use, in common with others, in and to said passageway, and all other rights, privileges and appurtenances to the same belonging, with one fourth part of a well situated in the rear of the adjoining house and partly in the common passageway, with the right to take water from said well. The premises hereby conveyed are subject to a mortgage of two thousand dollars, which said Woodburys agree to assume and pay as part of the consideration of this deed as above specified; for my title see deed from Noah Sturtevant, dated August 1, 1846, and recorded in the Suffolk Registry, lib. 567, fol. 204. To have and to hold the above-granted premises, with the privileges and appurtenances thereto belonging to the said Joseph P. Woodbury and James A. Woodbury, their heirs and assigns, to their use and behoof forever. And I, the said William Heath, for myself and my heirs, executors and administrators, do covenant with the said Woodburys, their heirs and assigns, that I am lawfully seised in fee of the aforegranted premises; that they are free from all incumbrances except as aforesaid; that I have good right to sell and convey the same to the said Joseph P. Woodbury and James A. Woodbury as aforesaid, and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said

Woodburys, their heirs and assigns forever, against the lawful claims and demands of all persons.

In witness whereof I, the said William Heath, with Sophia, my wife, who hereby releases all right of dower in the above-granted premises, have hereunto set our hands and seals this fourteenth day of June in the year of our Lord eighteen hundred and forty-seven.

WILLIAM HEATH. [SEAL]
SOPHIA HEATH. [SEAL]

Signed, sealed and delivered in presence of us,
JOHN ATKINS.
JANE S. TAPLIN.

COMMONWEALTH OF MASSACHUSETTS,
SUFFOLK, ss. JULY 19, 1847.

Then personally appeared the above-named William Heath, and acknowledged the above instrument to be his free act and deed.

Before me,
JOHN ATKINS,
Justice of the Peace.

August 6, 1847, 55 minutes past 12 o'clock P.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 579, fol. 162.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Be.—D.B.H., Special Examiner.

CERTIFIED COPY OF A GRANT OF AN EASEMENT IN A WELL FOR THE USE OF THE STEAM MILL OF JOSEPH P. AND JAMES A. WOODBURY, MADE TO THEM BY TOBIAS COOK, JULY 28, 1846, SAID WELL AND STEAM MILL BEING RECITED TO BE IN SAID GRANT IN EAST BOSTON, MASS.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

COOK to WOODBURYS.
Lib. 565, fol. 147.

Whereas Tobias Cook, of Hull in the County of Plymouth and Commonwealth of Massachusetts, the owner of an estate situated in East Boston in the County of Suffolk and commonwealth aforesaid, bounded, northwesterly, by Border street; northeasterly, by land of Samuel Hall; southeasterly, by land of H. S. Butler; southwesterly, by land of Gilbert and Hammatt, and having a well on the back or southeasterly part thereof; and also said Cook is the owner of a well situated southwesterly of said estate, in the junction of Border and Maverick streets in said East Boston, and Joseph P. Woodbury and James A. Woodbury, of said East Boston, copartners, are owners of an estate, with a steam mill thereon, situated in said East Boston, bounded, southeasterly, by said Border street; southwesterly, by land of said S. Hall; northwesterly, by the sea or channel; and northeasterly, by land of R. B. Forbes; and whereas said Cook has agreed that said J. P. and J. A. Woodbury may take and use water from said wells, for the purposes of said steam mill as hereinafter provided:

Now, therefore, know all men, that I, the said Tobias Cook, in consideration of one dollar to me paid, the receipt whereof is acknowledged, and of fifty dollars to be paid, as herein provided, by said Joseph P. and James A. Woodbury, do hereby grant and confirm unto the said J. P. and J. A. Woodbury, their heirs and assigns forever, the right and privilege of taking and using as much

water as may be required for the purposes of said steam mill, from said well situated on the southeasterly part of said estate as aforesaid, and all the surplus water from said well situated in the junction of said Border and Maverick streets, over and above what is used by those now having a right therein from me; also the right and privilege of laying down and maintaining all necessary pipes for the purposes aforesaid, said pipes to be laid in the passageway on the southwesterly side of said estate, now leading from Border street to said well in the rear, said fifty dollars to be paid by a note on six months; and if said pipes to said wells when put down and in order should not supply said steam mill with water to the satisfaction of said J. P. and J. A. Woodbury for six months from date hereof, then said note is to be given up and said pipes may be removed, and the rights and privileges hereby granted shall be reconveyed to said Cook, his heirs and assigns.

In testimony whereof I have hereto set my hand and seal this twenty-eighth day of July in the year eighteen hundred and forty-six.

TOBIAS COOK. [SEAL]

Executed in the presence of witnesses (in the second line the word Norfolk is erased and Plymouth interlined before signing),

J. BAYARD SPARE,
JOHN MULLIGAN.

SUFFOLK, ss. 30 JULY A.D. 1846.

Then personally appeared the above-named, Tobias Cook, and acknowledged the above instrument to be his free act and deed.

Before me,

JOHN ATKINS,
Justice of the Peace.

July 30, 1846, at 36 minutes past 5 o'clock P.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 565, fol. 147.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bd. — D.B.H., Special Examiner.

CERTIFIED COPY OF MORTGAGE, AND DISCHARGE OF SAME, MADE BY JOSEPH P. AND JAMES A. WOODBURY TO AMOS HILL, JR., AND HENRY Y. HILL, OF LAND IN EAST BOSTON, DATED MAY 27, 1848, DISCHARGE MARCH 4, 1851.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

WOODBURY *et al.* to HILL *et al.*
Lib. 590, fol. 237.

Know all men by these presents, that we, Joseph P. Woodbury and James A. Woodbury, of Boston in the County of Suffolk and Commonwealth of Massachusetts, mechanics, in consideration of one thousand dollars, paid by Amos Hill, Jr., and Henry Y. Hill, of West Cambridge in the County of Middlesex and Commonwealth aforesaid, yeomen, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Amos Hill, Jr., and Henry Y. Hill, their heirs and assigns, a certain piece or parcel of land, with the buildings thereon, situated in that part of said Boston called East Boston, bounded, described and measuring as follows; viz., beginning at the corner of Lexington and Marion streets, thence running southwesterly on said Lexington street twenty feet; thence turning at right angles and running northwesterly by a line through the centre of the partition between the house hereby conveyed and the house adjoining, seventy-six feet, to a passageway four feet wide, forever to be kept open; thence turning at right angles and running northwesterly on said passageway twenty feet to Marion street; thence southwesterly on said Marion street seventy-six feet to the point first begun at, with the right of use, in common with others, in and to said passageway, and all other rights, privileges and appurtenances to the same belonging, with one fourth part of a well, situated in the rear of the adjoining house and partly in the common passageway, with right to take water from said well. The premises hereby conveyed are subject to a mortgage of two thou-

sand dollars. For our title, see deed from William Heath, dated fourteenth day of June A.D. 1847, and recorded in Suffolk Registry, lib. 579, fol. 162. To have and to hold the above-granted premises to the said Amos Hill, Jr., and Henry Y. Hill, their heirs and assigns, to their use and behoof forever. And we, the said Joseph P. Woodbury and James A. Woodbury, for ourselves and our heirs, executors and administrators, do covenant with the said Amos Hill, Jr., and Henry Y. Hill, their heirs and assigns, that we are lawfully seised in fee simple of the aforegranted premises; that they are free from all incumbrances except two thousand dollars aforesaid; that we have good right to sell and convey the same to the said Amos Hill, Jr., and Henry Y. Hill, their heirs and assigns forever, except as aforesaid; and that we will, and our heirs, executors and administrators shall, warrant and defend the same to the said Amos Hill, Jr., and Henry Y. Hill, their heirs and assigns forever, against the lawful claims and demands of all persons. Provided, nevertheless, that if the said Joseph P. Woodbury and James A. Woodbury, their heirs, executors or administrators, shall pay unto the said Amos Hill, Jr., and Henry Y. Hill, their executors, administrators or assigns, the sum of one thousand dollars in three years and two months from the day of the date hereof, with interest on said sum at the rate of six per centum per annum, payable annually, and until such payment keep the buildings standing on the land aforesaid insured against fire in a sum not less than two thousand dollars, for the benefit of the first mortgagee and their executors, administrators and assigns, at such insurance office in as shall approve, and also pay all taxes levied or assessed upon the said premises; then this deed, as also a certain promissory note bearing even date with these presents, signed by the said Joseph P. and James A. Woodbury, whereby, for value received, they promise to pay to the said Amos and Henry Hill, or order, the said sum and interest at the times aforesaid, shall be absolutely void to all intents and purposes. And provided also that until default of the payment of the said sum or interest, or other default as herein provided, the mortgagee shall have no right to enter and take possession of the premises.

In witness whereof, we, the said Joseph P. Woodbury and James A. Woodbury, and Harriet E. B., wife of Joseph P., and Nancy D., wife of James A. Woodbury, in token of our release of all right and title of or to dower in the granted premises, have hereunto set our hands and seals this twenty-seventh day of May in the year of our Lord eighteen hundred and forty-eight.

JOSEPH P. WOODBURY. [SEAL]
JAMES A. WOODBURY. [SEAL]
HARRIET E. B. WOODBURY. [SEAL]
NANCY D. WOODBURY. [SEAL]

Signed, sealed and delivered in presence of (the word "first" interlined before signing)

NAT. D. HUBBARD,
witness to J. P. and J. A. WOODBURY.
MARY SHENY.
ELLEN L. SHENY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. MAY 29, 1848.

Then personally appeared the above-named Joseph P. Woodbury and James A. Woodbury, and acknowledged the above instrument to be their free act and deed.

Before me,
NAT. D. HUBBARD,
Justice of the Peace.

May 29, 1848, at 30 minutes past 12 o'clock P.M. — Received, entered and examined,

per HENRY ALLINE, *Reg.*

[In margin:] Boston, March 4, 1851. We acknowledge to have received full satisfaction for the debt secured by the mortgage here recorded, and do therefore hereby cancel and discharge the same.

AMOS HILL, JR.
HENRY Y. HILL.

Witness,
JAMES RICE.

A true copy from the Records of Deeds for the County of Suffolk, lib. 590, fol. 237.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Bc. — D.B.H., Special Examiner.

CERTIFIED COPY OF RELEASE OF NATHANIEL HAMBLIN TO JOSEPH P. AND JAMES A. WOODBURY, OF ALL INCUMBRANCES OR CONDITIONS HELD BY HIM ON LAND IN EAST BOSTON DEEDED TO THEM JANUARY 1, 1847, BY MIM, WHICH RELEASE IS DATED JUNE 16, 1847.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

HAMBLIN to WOODBURY *et al.*

Lib. 578, fol. 15.

Know all men by these presents, that I, Nathaniel Hamblin, of Boston in the County of Suffolk and Commonwealth of Massachusetts, painter, in consideration of one dollar to me paid by Joseph P. Woodbury and James A. Woodbury, of said Boston, copartners, and the covenants herein contained by them to be kept and performed, the receipt whereof is hereby acknowledged, do hereby remise, release and forever quitclaim unto the said Joseph P. and James A. Woodbury, their heirs and assigns, all and singular the conditions of every name and nature contained, mentioned and set forth in my deed to them, the said J. P. and J. A. Woodbury, their heirs and assigns, of a certain piece or parcel of land, with the buildings thereon, situated in that part of Boston called East Boston, and dated the first day of January in the year eighteen hundred and forty-seven, and recorded with Suffolk Deeds, lib. 571, fol. 263, and

all and singular the lands, privileges and appurtenances in said deed described and conveyed; and the said J. P. and J. A. Woodbury shall assume and pay the mortgage debt of nine hundred and thirty-three dollars and interest, mentioned in my said deed to them, and forever save me, my heirs, executors, administrators and assigns, harmless and indemnified therefrom, all which they covenant and agree to do by accepting this release. To have and to hold the above released premises to the said Joseph P. and James A. Woodbury, their heirs and assigns, to their use and behoof forever.

In witness whereof I, the said Nathaniel Hamblin, and Eliza A. my wife, in token of relinquishment of all right of dower in the granted premises, have hereunto set our hands and seals this sixteenth day of June in the year of our Lord eighteen hundred and forty-seven.

NATH'L HAMBLIN. [SEAL]
ELIZA A. HAMBLIN. [SEAL]

Signed, sealed and delivered in the presence of (the words "and thirty-three" being first interlined)

JOHN ATKINS,
JANE GRAY,
OTIS WILLEY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. JUNE 23, 1847.

Then personally appeared the above-named Nathaniel Hamblin, and acknowledged the above instrument to be his free act and deed.

Before me,
JOHN ATKINS,
Justice of the Peace.

June 25, 1847, at 24 minutes past 11 o'clock A.M.— Received, entered and examined,

per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 578, fol. 15.

Attest, THOMAS F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Cz.—D.B.H., Special Examiner.

CERTIFIED COPY OF WARRANTY DEED OF LAND IN EAST BOSTON, MADE BY JAMES H. WEST TO JOSEPH P. AND JAMES A. WOODBURY, DECEMBER 17, 1846.

[PUT IN EVIDENCE, PAGE 418, VOL. 1.]

WEST to WOODBURY *et al.*
Lib. 571, fol. 49.

Know all men by these presents, that I, James H. West, of Boston in the County of Suffolk and Commonwealth of Massachusetts, lumber dealer, in consideration of fourteen hundred dollars to me paid by Joseph P. and James A. Woodbury, of Boston, state and county aforesaid, mill owners and copartners, the receipt whereof is hereby acknowledged, do by these presents give, grant, bargain, sell and convey unto the said Joseph P. and James A., a certain piece or parcel of land, with the buildings thereon, situate in that part of said Boston called East Boston, being lot number thirty-four (34) on a plan called "subdivision of two hundred and twenty-three (223), section two," dated December twentieth, 1845, and recorded with Suffolk Deeds, bounded and described as follows; viz., southwesterly on Porter street, nineteen feet; northwesterly on lot number thirty-five (35) on said plan, fifty-five feet; northeasterly on a passageway five feet wide, forever to remain open, nineteen feet; and southeasterly on lot numbered thirty-three (33) on said plan, fifty-five feet; meaning and intending to convey the same as conveyed to me by Ebenezer Weeks, by deed dated November seventh A.D. 1846, and recorded with Suffolk Deeds; said property being subject to a mortgage in favor of R. S. Fay, from Robt. P. Pote, dated December A.D. 1845, for nine hundred and twenty-four $\frac{50}{100}$ dollars. To have and to hold the above-granted premises, with the privileges and appurtenances thereto belonging, to the said Joseph P. and James A., their heirs and assigns, to their use and behoof forever. And I, the said James H. West, for myslf and my heirs,

executors and administrators, do covenant with the said Joseph P. and James A., their heirs and assigns, that I am lawfully seised in fee of the aforegranted premises; that they are free from all incumbrances except the mortgage to Fay aforesaid; that I have good right to sell and convey the same to the said Joseph P. and James A., as aforesaid; and that I will, and my heirs, executors and administrators shall, warrant and defend the same to the said Joseph P. and Jas. A., their heirs and assigns forever, against the lawful claims and demands of all persons.

In witness whereof I, the said Jas. H. West, together with Mary D. my wife, in token of her relinquishment of dower in the premises, have hereunto set our hands and seals this seventeenth day of December in the year of our Lord eighteen hundred and forty-six.

JAMES H. WEST. [SEAL]
MARY D. WEST. [SEAL]

Signed, sealed and delivered in the presence of
L. H. CHANDLER,
to J.H.W.
ELIZA W. WEST.

SUFFOLK, ss. BOSTON, December 17, 1846.

Then personally appeared the within-named James H. West, and acknowledged the within instrument to be his free act and deed.

Before me,
L. H. CHANDLER,
Justice of the Peace.

December 17, 1846, at 15 minutes past 4 o'clock P.M.— Received entered and examined,

pr. HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 571, fol. 49.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Cy. — D.B.H., Special Examiner.

CERTIFIED COPY OF LEASE AND AGREEMENT MADE BETWEEN JOSEPH P. WOODBURY AND ASA SAWYER, JR., IN RELATION TO THE MILL AND PROPERTY OF JOSEPH P. WOODBURY IN BORDER STREET, EAST BOSTON, AND IN RELATION TO THE EXHIBITION AND PROMOTING OF THE SALE OF THE SAID JOSEPH P. WOODBURY'S PATENT STATIONARY KNIFE PLANING MACHINES, BY THE SAID SAWYER, SAID LEASE AND AGREEMENT BEING DATED JULY 14, 1851.

[PUT IN EVIDENCE, PAGE 419, VOL. 1.]

WOODBURY to SAWYER, JR.

Lib. 623, fol. 96.

This indenture, made this 14th day of July A.D. one thousand eight hundred and fifty-one (1851), witnesseth, that I, Joseph P. Woodbury, of Lynn in the County of Essex and State of Massachusetts, do hereby lease, demise and let unto Asa Sawyer, Jr., of Saugus, of the county and state aforesaid, a certain steam mill and other buildings belonging to me, together with the wharf situated in East Boston in the County of Suffolk and state aforesaid: it being the same lot of land conveyed by Samuel Hall to J. P. and J. A. Woodbury, to hold the same premises, with the rights, easements and appurtenances to the same belonging, for the term of five years from August 7th A.D. 1851. The said lessee has the right to give up this lease at the end of two and one quarter years, by giving the said lessor six months' notice in writing, prior to that time; but if not terminated at that time, then to remain in full force for five years as before mentioned unless sooner terminated by mutual agreement between the parties, expressed in writing. The said Asa Sawyer, Jr., his representatives and assigns, yielding and paying therefor the rent of two thousand dollars per annum, and said lessee, for himself, his representatives and assigns, that he or they will pay the said rent in quarterly yearly payments of five hundred dollars ($500) for each

and every quarter during said term, after the first two and one fourth years, the first quarterly payment to be made on the 7th day of February, 1854; the rent of the premises for the first two and one fourth years is to be paid by the said lessee, in advance, by a deed of certain real estate in Danvers, County of Essex and state aforesaid, to the said lessor. The said lessor reserves the back room of the counting-room building to his own exclusive use, together with the right of occupying so much of the front room of the counting-room building as is necessary for one desk and one safe, and the transaction of his business generally, in common with the said lessee. The said lessee agrees to assume the lease of Woodbury, Haines & Co., given to James C. Davis, David H. Day and Thos. Whittemore, Jr., for the term of five years from 7th August, 1850, and dated October 1st, 1850. And the said lessee, is to do, and furnish all that the said Woodbury, Haines & Co., were to do to the full end of the term for which it was given, or until the termination of this lease. The said lessee is to keep the premises, building, machinery and mill in repair, and deliver the same up at the end of the term in as good order as the same now are, except the usual wear and other unavoidable casualities, and is not to run any other kind of planing machines except the Woodbury's patent machines, and which are to run continually when there is any work to be done, for the whole term of the lease; and the said lessee agrees to do all in his power to bring the Woodbury patent machine into notice and good repute, and at all times to exhibit the same to those who may from time to time call to see the machine operate (not however to disturb the usual business of the mill), and to do all in his power to advance said Woodbury's interest in his patent by such exhibitions; and the said lessee agrees to run the machine with great care, and to employ one competent man to take charge of the whole of said machinery, whose business shall be to see that it is properly used and operated; and further, the said lessee agrees to keep a quiet and orderly place, and not permit any smoking of tobacco on the premises, or to do any business more hazardous than working wood by machinery, and that the said lessee may put into the said mill, at his own expense, one additional new boiler, of the same size and

construction and like foundation as the one now in the mill; and the said lessor will allow him, at the expiration of the lease, what said boiler is worth; said boiler to be placed on the east side of the one now in the mill and parallel thereto; and the said lessee, and those holding under him, will use the Cochituate water and pay the water tax. The said lessee agrees to allow the lumber and wood of Woodbury, Haines & Co., and J. P Woodbury, to remain on the wharf three months from August 7, 1851, free of expense, and for all time afterwards until sold; the said lessee is to receive six cents per one thousand feet per month for wharfage. The said lessee agrees to allow Woodbury, Haines & Co. the right of occupying the front room of the counting-room building; in common with the lessee and lessor for the closing of their business. The said lessee is to keep a roll of zinc in the boiler to prevent it from corroding. The said lessee has the right to underlet power and rooms, or parts of the wharf, for any business except the planing of lumber, not more hazardous than working wood; provided, however, that the said lessee has no right to lease or underlet the engine or planing machines, or that part of the building where the planing and sawing is done, but he is to continue to use the above machines himself. If the said lessee shall desire to build any buildings on said lot to accommodate his business, he may have the right to do so at his own expense, providing he does not increase the hazard of the premises. Notice must be given said lessor of said lessee's intention to build, in writing, beforehand. And further, if the said lessee should die at any time after two and one quarter years from the commencement of this lease, his heirs may have the right to continue the lease or to give it up after paying all arrearages for rents due to the said lessor. The said Woodbury agrees to put in one 24-inch surfacing machine made from the latest patterns, and one clapboard machine of the latest pattern, and is to take out all of the planing machines now in the mill, except the old wooden frame machine; and further, the said lessor is not to license any other planing machine in East Boston, under his patent during the time this lease is in force. In case the building and machinery is burnt up or damaged by fire, the said lessor agrees to rebuild the mill

again within three months, if in summer, and four months, if in the winter, and may build on any other plan of building, provided it is, on the whole, as good as the old mill, and the said lessee is not to pay only one half rent until the mill is ready to run again; and if the mill is burnt within two and one fourth years from August 7, 1851, then the lessor is to allow the lessee at the same rate during the same time. The said lessor is to pay the city and county taxes, and agrees to put in the new planing machine spoken of, within three months, and the clapboard machine within four months from date; and until the new planing machine is ready, the said lessor will allow the old iron planing machine to remain in the mill; and that the lessor or his agent may enter to view and make improvements, and to expel the lessee if he shall fail to pay the rent as aforesaid, or make or suffer any strip or waste thereof. Said lessee shall have the right to let power to operate one or more of the machines called Daniells' planing machines, to plane timber, sash and door stuff and also machines for sticking sashes; but not however to use or permit any other machines to be used on the premises for planing boards and plank, &c., but said Woodbury's patent machines as aforesaid.

In witness whereof, the said parties have hereunto interchangeably set their hands and seals, this fourteenth day of July A.D. 1851. In duplicate the "and the clapboard machine within four months" interlined before execution, and also "use Cochituate water" and also "when there is any work to be done."

JOSEPH P. WOODBURY. [SEAL]
ASA SAWYER, JR. [SEAL]

Executed in presence of
A. W. HAINES,
GEORGE G. EMERSON.

July 22d, 1851, at five o'clock P.M.—Received, entered and examined,

Per HENRY ALLINE, *Reg.*

A true copy from the Records of Deeds for the County of Suffolk, lib. 623, fol. 96.

Attest, THOS. F. TEMPLE, *Reg.*

DEFENDANT'S EXHIBIT Cy.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, No. 64,821, DATED MAY 14, 1867.

[PUT IN EVIDENCE, PAGE 425, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury, of Boston, Massachusetts, has alleged that he has invented a new and useful Improved Locomotive Truck and Engine, which he states has not been known or used before such invention; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said invention, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, praying that a patent may be issued therefor:

These are therefore to grant, according to law, to the said Joseph P. Woodbury, his heirs, administrators or assigns, for the term of seventeen years from the fourteenth day of May, one thousand eight hundred and sixty-seven, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said invention, a description whereof is given in the schedule hereunto annexed, and made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office to be hereunto affixed.

Given under my hand, at the city of Washington, this fourteenth day of May in the year of our Lord one thousand eight

[L.S.] hundred and sixty-seven, and of the independence of the United States of America the ninety-first.

W. T. OTTO,
Acting Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

T. C. THEAKER,
Commissioner of Patents.

UNITED STATES PATENT OFFICE.

JOSEPH P. WOODBURY, OF BOSTON, MASSACHUSETTS, LETTERS PATENT NO. 64,821, DATED MAY 14, 1867.

IMPROVED LOCOMOTIVE TRUCK AND ENGINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented certain new and useful improvements in Locomotive Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists, first, in so constructing a locomotive engine that each of its trucks shall be free to swivel and vibrate (so as to adjust themselves perfectly to the curves and irregularities of the track), independently of the main carriage, also of each other; second, in having a separate pair of vertical cylinders, and their working gear being attached directly to the truck and

swivelling with the truck of main carriage and boiler; third, the steam for each pair of cylinders being supplied from one horizontal boiler, having a steam dome near each end of the same, and being conducted by a pipe that moves with the cylinders by means of a stuffing-box; fourth, the exhaust pipes keeping a relative position equally with the boiler by means of the stuffing-box.

The principal features in which my improved locomotive engine differs from others may be set forth as follows:

First. Each wheel upon which the engine rests is a driver, therefore the whole weight of the engine is available for giving tractive power. About half of the weight of the engines, as ordinarily constructed, is supported by the wheels of a dummy truck, and consequently not available for tractive power.

Second. The driving-wheels are not rigidly attached to the frame of the locomotive, nor to the boiler, nor to each other, but are so constructed and attached that they are free to adjust themselves to all the irregularities of the track.

Third. By supporting my locomotive upon trucks of my improved construction, I can make the supporting frame very long, so as to admit of a boiler of large capacity; also to carry upon it fuel-boxes.

Fourth. It is well known that a large engine will not run with safety on a curve of less radius than six hundred feet, while an engine constructed after my plan can run as safely and almost as easily on curves of a short radius as upon a straight track. Indeed a large engine, constructed upon my improved plan, will traverse a curve of one hundred feet radius, while the smaller kinds will run on a curve of fifty feet radius. This peculiarity renders my engine very valuable for railroads of mountainous regions.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and use. In the drawings,

On sheet No. 1,—

Figure 1 represents a side elevation of my improved locomotive engine.

Figure 2 represents a plan of the same, a part of the top of the cab removed so as to show the fuel-boxes E E.

Figure 3 is an enlarged view of the coupling attached to the upper end of the front "reverse handle," indicated by U, figs. 1 and 2.

On sheet No. 2,—

Figure 4 represents the front elevation of the engine.

Figure 5 is a cross vertical section of the engine.

Figure 6 is a plan of one of the trucks.

Figure 7 is a plan showing the method of attaching the truck to the frame of the locomotive.

On sheet No, 3.—

Figure 8 is a longitudinal vertical section through the front truck and the front part of the boiler, steam dome, supply and exhaust pipes.

Figure 9 is an enlarged section showing the method of connecting the supply and exhaust pipes with the steam dome.

Figure 10 is a plan showing the part of the truck and locomotive-frame as it would be modified for outside connections.

Description.

As the boiler, its furnace, steam domes and smoke stack are made after the ordinary manner, no details of description need be given. The rear end of the boiler is rigidly attached to the frame A, figs. 1, 2, 3, 4 and 5, by means of suitable bolts and stays not shown in the drawings; the front end of the boiler is also rigidly attached to the frame by means of the casting *g*, figs. 1, 4 and 5, and the intermediate frames *c c c c*, figs. 5 and 7, or in any substantial, workmanlike manner that will admit of the application of my improvements. The general construction of the frame A is indicated in the drawings, figs. 1, 2, 4, 5 and 7. This frame should be carefully and strongly made, as it has to support the boiler, the cab, fuel-box and water-tank. The truck-frame K K is constructed in form as represented in figs. 6, 7 and 8. The journal-boxes *g g*, fig. 8, have springs, *h h*, and are connected to the journal-box *s*, fig. 8, of the crank-shaft *t* by means of the radial arms *f f*. These radial arms are rigidly attached

to the boxes *g*, but have a swing-joint attachment to the box *s*, so that the journal-boxes *g g* will oscillate considerably without disturbing the crank-axle *t*. The truck-frame K K is attached to the frame G G, which supports the engine-frame X X, by means of the bolts *u u u u*, fig. 5, and the short compound cylinders I I I I, fig. 4. These short cylinders are so constructed that the lower part slides into the upper part, and rests upon an elastic cushion, *d*, fig. 5. The frame G, figs. 4, 5 and 7, has combined with it a circular groove in which radial rolls *a a a a*, fig. 7, are hung. These radial rolls traverse upon the under surface of a circular platform which is combined with and forms a part of the locomotive-frame *c c c c*, A A, figs. 5 and 7. The frame G swings upon a substantial centre-pin, *r*, fig. 5, which is attached to the locomotive-frame. The journal-box *s* and housing, fig. 5, are suspended to the frame G by the suspension-rods *e e*. As there is nothing peculiar about the eccentrics, valves, valve-stems, pistons or cylinders, particular description is not essential. The link motion, S, fig. 1, for regulating the cut-off, is made in the usual manner, and is operated or adjusted by the reverse-handles N N, also made in the usual manner, excepting the front reverse-handle, which has a coupling, U, and a long rod, Z, acting as a handle, so that the engineer standing in the cab may operate the front reverse-handle. The construction of the coupling U, fig. 1, may be understood by inspection of the drawing, fig. 3, in which *a′ b′ c′* form together a universal joint. *d′* is a crank-disk attached to *c′*. To this crank-disk is connected the rod *w*, by means of the pin *g′*, so that when the disk is made to revolve the catch-bolt *u*, figs. 1 and 3, is made to move up and down, that is, into or out of the notches in the gear-plate *x*, fig. 1.

Steam dome and connecting pipes: fig. 9 is an enlarged sectional view, showing my method of connecting the supply and exhaust pipes to the steam dome of the boiler. As my engines swivel independently of the boiler, the supply and exhaust pipes and all of their connections are made in a peculiar manner, and require particular description. D, figs. 8 and 9, sheet No. 3, steam dome to which is attached a hollow nut, D′ D′, fig. 9. Within this hollow nut two rings *n n n n* screw in such a manner as to hold between them the

ring O into which the supply pipe F screws. The supply pipe F, with its ring O, is free to revolve, and is made steam-tight by packing between the packing-nut *m m* and the ring *n n*. *p p*, figs. 8, 9 and 2, is a plate, connecting the two parts X X, figs. 1 and 2, together, and staying the whole upper part of the engine frame, so that the pipe leading from the cylinders to pipe F shall in nowise be strained. The upper end of the pipe F, fig. 9, is attached to the cap P, into and from which the exhaust flows, by means of rings *i i i i* and the packing-box *l l*. The pipe J, figs. 1, 8 and 9, together with the pipes J′ J′, conducts the steam from the steam dome to the working cylinders. T, figs. 1, 2 and 8, is a throttle in the pipe J. The pipe Y, figs. 1, 8 and 9, together with the pipes Y Y′, figs. 1 and 2, forms the exhaust pipes leading from the cylinders into the upper part of the pipe F, and through P and H into the smoke-stack. The exhaust pipe H can be taken into the smoke-stack much lower down than it is represented in the drawings, if desirable, in order to get a better blast.

I construct my water-tank in the frame of the locomotive between the two trucks, immediately under the boiler, shown by W, figs. 1 and 2. The sides of the tank may be carried up, upon either side of the boiler, if desirable, in order to get more water space. The object of thus placing the water-tank is to take advantage of the open space which the construction of my engine leaves between the trucks. It is also, as will be readily understood by all engineers, the best possible place for a water-tank, as it tends to lower the centre of gravity of the engine as a whole, and also, by its weight, gives additional tractive power. The reverse-handle, with its connecting-lever, is attached to a metallic plate, V, figs. 1 and 2. This plate V is rigidly attached to the frame of the engine, so as to revolve with it, and thus keeps the reverse-gear in its proper relative position with the engine. The fuel-boxes E E, figs. 1 and 2, may be constructed substantially as shown in the drawings. P′, fig. 1, is an air-receiver or shield, opened at the front part so as to collect air and pass it through the ash-box to the fire. In case it is desirable to have a very long boiler, the trucks may be set further apart,

which will admit of the ash-pan and fire-box being lowered down so as to come just in front of the rear truck.

Having thus described my invention, I will now proceed to set forth my claims. What I claim as my invention, and desire to secure by letters patent of the United States, is —

1. A locomotive engine constructed with horizontal boiler, resting entirely on trucks which have free lateral oscillation, independently of the boiler, these trucks being provided with vertical frames, as shown and described, for purpose set forth.

2. The vertically acting cylinders, in combination with a frame which oscillates rotatively with the truck independently of the boiler.

3. The combination and arrangement of the supply pipes F, the pipe F, exhaust pipe Y, cap P, and pipes H.

4. The combination of the circular series of radial rollers *a*, with the concentric rings, as shown in fig. 5, holding the axes of the same, and the horizontal boiler and the truck.

5. The combination of the operating-rod Z, toggle-joint U, and reverse-handle N, as shown in figs. 1 and 3.

6. The combination and arrangement of the arms *f f*, the journal-boxes *g g* of the driving wheels and journal-box S, as shown in fig. 8.

7. The rod Z′, with swivel connections, in combination with the throttle T of the forward engine.

8. The swivel-plate or yoke *p p*, in combination with the engine-frame and steam dome.

9. The combination, as well as the arrangement of the pipe F, and its adjuncts with the steam dome, D, as shown in fig. 9.

All of which are substantially as described and for the purpose set forth.

JOSEPH P. WOODBURY.

Witnesses:

WILLIAM EDSON,

A. HUN BERRY.

DEFENDANT'S EXHIBIT Cx.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 35,193, DATED MAY 6, 1862.

[PUT IN EVIDENCE, PAGE 425, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury, of West Roxbury, Massachusetts, has alleged that he has invented a new and useful improvement in army war vessels, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph P. Woodbury, his heirs, administrators or assigns, for the term of seventeen years from the sixth day of May, one thousand eight hundred and sixty-two, the full and exclusive right and liberty of making, constructing, using, and vending to to others to be used, the said improvement, a description whereof is given in the words of the said Joseph P. Woodbury in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this sixth day of May in the year of our Lord one thousand eight hundred [L.S.] and sixty-two, and of the independence of the United States of America the eighty-sixth.

CALEB B. SMITH,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, in the County of Norfolk and State of Massachusetts, have invented a new method of *arming war vessels*; and I do hereby declare that the following is a full, clear and exact description of the construction and operation thereof, taken in connection with the accompanying drawings, making a part of this specification, in which —

Figure 1 represents a longitudinal vertical section of a vessel, showing the application of the armament thereto.

Figure 2 represents the same, one half in plan and the other half in horizontal section below the deck at the centre of the guns.

Figure 3 is a transverse vertical section through the trunk and through the hull at the centre of one of the guns.

Figure 4 is a vertical longitudinal section of a part of the bow of the vessel, showing the application of the bow gun.

Figure 5 is a horizontal section of a part of the hold amidships, showing one of the side guns in plan.

Figure 6 also shows the bow gun in plan with that part of the vessel in horizontal section.

Figure 7 represents a vertical longitudinal section of the gun, showing the disposition of the cartridge, projectile, displacing case, and arrangements for loading at the breech; and

Figure 8 is a back end elevation of the gun, showing the application of the firing needle and the bar for holding it to the breech screw.

The subject matter of my invention relates to a method of arming a vessel for warlike purposes, both as regards its means of attack and defence; and is designed more particularly to enable a vessel to attack and overpower the iron-clad war steamers which are now being built by the naval powers of the world; and also to be constructed and employed at a reasonable cost. The manner in which I propose to accomplish the object may be stated, in a general way, to consist, first, in providing a vessel of a good model, shallow draught of water, and of a capacity to carry coals and machinery sufficient to excel in speed the vessel to be attacked; second, in providing means for sinking it to the deck by water ballast when going into action, so as to expose the smallest possible of the ship to an enemy's fire, which part only would require to be plated with thick iron to protect it; third, in making the deck convex or circular, both longitudinally and transversely, so that when the vessel is sunk to a fighting trim, the sides of the deck will be below water, and the surface exposed will be presented to an enemy's shot at a low angle, and the centre of the deck sufficiently above water to enable the vessel to be worked in a sea way; fourth, in forming in the middle of the deck a low, oblong trunk projecting a short distance above it, which is also plated and made a part of the deck, through the sides of which are small holes, through which observations are made, and the deck can be defended by musketry by ejecting hot water, or in any other manner; through the top of this trunk the smoke from the boilers emerges, and the ventilation is effected, and within the same the movements are directed and the vessel steered; fifth, for the purpose of attack, the vessel is provided with say three or more breech-loading cannon of large calibre, which are mounted, one at the bow, ranging fore and aft, and one on either side, ranging athwart ship, the muzzles of which extend through the sides of the ship at a considerable distance (say ten feet, more or less) under water, and are provided with many accessory devices, to be hereafter fully described, to enable the guns to be worked under such conditions. They are de-

signed to carry a large hollow, oblong projectile or shell, carrying a great bursting charge, which is to be thrown into the hull of the vessel attacked, and there exploded by a fuse. The guns are passed through stuffing-boxes in the side of the hull, and have no movement excepting in a longitudinal direction, and are not proposed to be aimed, as they are designed to be used only when near to the object to be assailed.

My invention consists, in the first place, in the employment in connection with a vessel so defended with armor plates, or their equivalent, that it may approach an enemy with safety, of ordnance constructed and operating substantially in the manner to be hereinafter explained, which is arranged so as to project horizontally through the side of the vessel below the surface of the water, and to be worked in that position for the purpose of attacking a hostile ship in parts that cannot be assailed from above the water.

Second, in making the guns with the part that passes through the side of the ship cylindrical, and the employment therewith of a suitable gun carriage to support the breech of the gun; a stuffing-box and socket or sleeve in the side of the vessel to receive the muzzle of the gun, and an external port or shutter which closes outside of the gun, or other devices equivalent thereto, for the purpose of enabling the gun to be drawn in and loaded or removed and run out to be fired. Thirdly, in displacing the water from the bore of the gun, when it is loaded, by means of a hollow displacing case, or its equivalent, which nearly fills all of the bore of the gun not occupied by the charge, so as not to fire against a column of water within the gun equal to the contents of the bore, but to start the projectile and move it while within the gun in an atmosphere of air or gas.

Description. — The same letters are used in all the figures to indicate the same parts. A represents the hull of the vessel made of iron in the usual way, and of the usual form of model below the water, adapted to sail in shoal water and propelled by a screw, with any desired form of engines and boilers, the position only of which are represented in the drawings, as my invention does not pertain to them. It is also designed to be fitted with water-tight bulkheads

in appropriate places for safety and convenience, which are not represented. B represents the deck; its general form transversely to the ship is that of a portion of a circle, joined to the sides of the hull by a circle of smaller radius which is tangent to both, as is shown in figure 3, which represents the form amidships. This form is adopted for the purpose of having it at the centre at considerable height above the water when the sides are below the water, and also to present the exposed surface at a low angle to an enemy's fire; and it is also a good form to vessel boarding by the enemy. This deck is covered with iron plating, which extends some distance below the water when the hull is submerged, of sufficient thickness to repel any shot that may be fired against it, which, from the low angle of the surface presented to an enemy's fire, may be made of much less thickness than if it were exposed at nearly a right angle. The radius of curvature of the deck diminishes towards each end, and forms into the bow and stern, so as to show a curved outline longitudinally, as is seen in figure 1. This form of constructing the deck is important as enabling the upper part of the ships to be made invulnerable by a *minimum* weight of plating, which again enables an amount of efficiency in speed and capacity to be obtained by a smaller ship than could be otherwise done. C is a trunk or observatory built in the middle of the deck, and projecting a short distance above it, of the form shown in the drawings, and plated also with metal heavy enough to withstand any shot that can be thrown against it. It is provided "peep holes," C, through the sides, as shown, through which external objects may be observed and the deck defended from boarding, by musketry or otherwise, as has been before stated. The trunk upon the top is provided with shot-proof gratings, D and E. Through the grating D the smoke from the chimney emerges, and through the gratings E the ventilation of the hold is effected by blowers arranged in any suitable manner. This trunk is built in with the deck, and forms a part of it; and by projecting above the deck it enables an open communication to be preserved from the hold to the external air when in a sea way, with the vessel submerged to a fighting trim, preventing the waves that

would come on deck, from entering the interior. F, F, are fan blowers for ventilating the hold, and they are provided with suitable pipes leading to the several compartments. It is proposed to discharge the foul air into the space around the chimney, but it may be arranged in any convenient manner.

G, G, are tanks or compartments for the water ballast to sink the vessel to fighting trim. They may be disposed in any convenient manner, and provided with proper sea cocks for filling the same, and pumps for emptying them, worked by a steam engine. The employment of blowers for ventilating vessels, and of water ballast, and the sinking and raising of vessels by filling and emptying tanks or compartments, not being of my invention, I do not deem it necessary to describe and represent these parts in detail, but mention them only as forming a part of the arrangement in my system of armament, which may be constructed in any way that will best accommodate the purposes of the vessel. H is the rudder stock which passes through a stuffing box, *h*, in the stern, as shown, and is worked by a tiller, *b*, and chains extending forward under deck to the steering wheel I, within the trunk, in the ordinary manner. J, J, J, are the guns. They are made to load at the breech in any well-devised manner that is found to be efficient. The form shown is substantially that of the "Armstrong gun," so called, as a good example. They are made very heavy, and from about the middle to the muzzle they are made cylindrical, so as to be able to slide back and forth in the stuffing boxes K in the side of the hull. They are mounted at the breech upon the slides L, which move longitudinally upon their beds M, in the manner of the modern improved ship's gun-carriages. They have only a longitudinal movement to run out the gun to fire it, and to permit its recoil when discharged or to be drawn in to load it. To prevent too great an extent of recoil, the slides L are made to bring up against a series of india-rubber springs or cushions, N, which arrest a further inward movement. The slides L are provided with trucks, *a*, *a*, which are worked upon an eccentric shaft in the usual way, to facilitate the running out of the guns, and may also be provided with frictional devices to increase the resistance

to recoil, as is done in gun-carriages now used. They are also provided with a rack and pinion, T, worked by a ratchet lever, U, to run out the guns, or they may be worked by tackles instead. The stuffing box K, which forms a socket for the gun, is securely fastened to the hull, either at the bow or at the side, as shown in the drawings, and is provided with a shutter, or port, P, which is made to shut water-tight, and to open outward and upward, and is worked by jointed rods, Q. The port of the bow gun is made pointed externally, to offer less resistance to the water when the vessel is in motion; but those at the side are made to shut in flush with the outside. The rods Q pass through longitudinal passages and stuffing-boxes on each side of the gun, so that the shutter or port can be opened and closed upon the inside by moving the rods Q back and forth. When the gun is drawn in, and the shutter closed, it permits the breech of the gun to be opened to load it, the water in the gun escaping into the hold. The manner of loading the gun is shown more clearly in figure 7, where the gun and its contents are shown in section, *d* representing the charge of powder in a water-tight cartridge of copper or other suitable material, in the rear end of which, at *e*, is a fulminating primer within it, which is exploded by a driver or needle, *g*, inserted at the centre of the vent piece, *f*, by a blow upon the outer end, *h*, from a lock or hammer; or instead thereof, the cartridge may be fired in any other suitable manner. The outer end of the driver *g* is held by the bar *i*, upon the breech-screw V, which is constructed so as to be removed with the driver when the gun is to be opened. R is the projectile. It is a long, thick shell, of sufficient strength to penetrate a ship's side when not deformed by thick plating, and has a cavity sufficient to contain a large quantity of gunpowder. It is designed to be fired with a small charge so as not to send it out of an enemy's vessel at the opposite side, and to be itself fired by a fuse.

The remainder of the bore is filled up with a water tight-case S, of tin or other thin metal, whose purpose is to displace the water from the bore of the gun, so that the discharge will not have to expel a mass of water therefrom, the weight of which would have the

effect of adding so much to the weight of the projectile, and produce an increased recoil of the gun. This case may be made to enclose the projectile and charge, or occupy the space in front of them as may be desired. The case, projectile and cartridge all fit the bore loosely, as there is no provision for firing with accuracy, nor is any needed, as they are designed to fire at an object only when near it. But the guns may be rifled, or the projectiles made wings to give them rotation, to ensure their motion endwise, if desired. These guns I propose to arrange as shown, namely, one at the bow and in a line with the keel, and one at either side; or two or more could be placed at the side if desired. W is the windlass placed below deck, with the cable leading upward over a sheave X, on deck to a hawse pipe Y, as is shown. The vessel may be fitted with hatches when required, closed by gratings or hatch covers made shot-proof.

The manner of attacking such a vessel is to chase the enemy at a light draught, until within reach of his guns. The vessel is then submerged so as to expose only the deck to his fire, which enables it to approach him with impunity. When almost in contact with him, the gun that bears most advantageously upon him is fired and the projectile is thrown through his side far below the part usually protected by plating, and left within the hold to explode at the proper time and destroy everything in its vicinity. No vessel ever yet made could withstand the effect of one shot under such conditions, neither the explosion of the shell nor the opening made through the side so far below water; one shot would suffice to end the conflict.

Having thus set forth my invention, what I claim is as follows:

First, the employment of a gun or guns constructed and operated substantially as described, in a ship so constructed and defended with armor plates or their equivalent, that the ships may approach an enemy with reasonable safety, substantially in the manner and for the purpose described.

Second, combining a gun, constructed and employed in a vessel as described, with an appropriate gun-carriage to support the breech, a socket and stuffing box in the side of the hull to support the muzzle, and an external port or shutter, or other devices equivalent thereto, to enable the gun to be worked substantially as described.

Third, displacing the water from the bore of the gun between the charge and muzzle, by means of an air-tight displacing case, or its equivalent, substantially as described.

JOSEPH P. WOODBURY.

Witnesses:

W. J. DEXTER,

WM. C. HIBBARD.

Ex.—J.A.W.

DEFENDANT'S EXHIBIT Cw.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODRURY, No. 94,466, DATED AUGUST 31, 1869.

[PUT IN EVIDENCE, PAGE 425, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph Page Woodbury, of Boston, Massachusetts, has alleged that he has invented a new and useful Improvement in Railway Freight Cars, and has made oath that he is a citizen of the United States; that he verily believes he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents praying that a patent may be issued therefor:

These are, therefore, to grant to the said Joseph Page Woodbury, his executors, administrators, or assigns, for the term of seventeen years from the thirty-first day of August, one thousand eight hundred and sixty-nine, the full and exclusive right and liberty of making, using, and vending to others to be used, the said improvement, a description whereof is given in the annexed schedule and made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office to be hereunto affixed.

Given under my hand, at the city of Washington, this thirty-first day of August in the year of our Lord one thousand [L.S.] eight hundred and sixty-nine, and of the independence of the United States of America the ninety-fourth.

W. T. OTTO,
Acting Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

SAM'L L. FISHER,
Commissioner of Patents.

UNITED STATES PATENT OFFICE.

JOSEPH PAGE WOODBURY, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 94,461, dated August 31, 1869.

IMPROVEMENT IN RAILWAY FREIGHT CARS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Joseph Page Woodbury, of Boston in the county of Suffolk and State of Massachusetts, have invented a certain new and useful improved System of Freight Transportation; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in arranging a freight-cab, which is provided with base-rails or wheel-ways, in connection with a platform railroad-car and a street-dray, the whole being so constructed and arranged that the cab may be readily transferred from the one to the other on flanged wheels.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and use:

Drawings.

Figure 1 represents, in perspective, a platform railroad-car, the outline of the freight-cab being indicated by dotted lines.

Figure 2 represents, in perspective, a street-dray, with a freight-cab on it.

Figure 3 is a cross-section, showing parts of the platform-car and freight-cab.

Construction.

A B, fig. 1 represents a strong frame, made substantially as shown, or in any suitable manner, and supported by ordinary railroad-trucks, E E′, these trucks being connected to the frame A B by any of the approved methods.

This frame A B is provided with series of axles H H′ H″, &c., arranged so as to revolve freely in the frame, and have at each end a flanged wheel, K, upon which the wheel-ways, O O, figs. 2 and 3, of the freight-cab, rest.

M M, &c., are buttons or dogs, attached to the platform of the car, and also to the dray, and serve, in connection with the hooks L and L′, to hold the cab firmly in position.

The street-dray, fig. 2, is provided with wheels K K, &c., arranged to operate substantially as those of the car already described, and serves for the same purpose.

The end of the dray, fig. 2, is provided with a windlass, P, of any approved construction. The one represented in the drawings is fully described in Henry F. Shaw's letters patent dated May 21, 1867.

Each dray and platform-car is provided with suitable sheaves, R, over which traction-ropes may pass, by means of which the loaded cab is transferred from the car to the dray, and *vice versa*.

The freight-cab N is provided with base-rails or wheel-ways O O, figs. 2 and 3, which rest upon the flanged wheels K K, &c.

This cab is made of convenient size and style to suit the merchandise to be transported, and designed to fit the car or dray equally well, so that it may be used on one or the other.

Instead of one large cab, two or even more smaller ones may be placed upon the same platform for convenience in transporting certain classes of freight.

If desirable, the cab can be made as wide as the whole space between the wheels, in which case the wheel-ways O O would not be on the outer edges of the cab, but be located so as to accommodate the flanged wheels K K, &c.

If more convenient, the wheel-ways on the under side of the cab, and the flanged wheels K K, &c., may be set transversely to the cab, so that it may be loaded and unloaded to and from the side of the car or dray, in which case the dray-wheels would have to be smaller in diameter than those represented in the drawings.

In the drawing, S represents a rope, connected to the windlass, which may be passed around the sheave R, and connected to the eye-bolt Q of the cab N, fig. 2, for the purpose of drawing it on.

To draw the cab N off from the dray on to the platform of the car, the rope S from the windlass, as shown at S^1 S^2, is passed around the sheave R^2, then back to an eye-bolt made in the rear of the cab N, then, by turning the windlass P, the cab will be drawn on to the car.

My invention may be used as follows: —

The dray with the freight-cab N may be loaded at the manufactory or place of supply, and thence taken by horses to the railroad station, at which place the freight-cab N is hauled off directly from the dray, by means of ropes and windlass, on to the platform-car A B, fig. 1, to which it is made secure.

It is then transported on the railroad to the delivery-depot, at which place it is reloaded on to a dray, similar to the one represented in fig. 2, and carried to the place or places of destination.

By my system of transportation, the goods transported need not be handled at all by the freight-hands, the freight-cab being locked by the merchant shipping the goods, to be unlocked only by the receiver.

What I claim as my invention, and desire to secure by letters patent, is —

1. The cab N, when used in connection with the car A B and dray C D, for the transportation of freight, substantially as set forth.

2. The flanged wheels K K, &c., in connection with the car platform, substantially as described and for the purpose set forth.

3. The flanged wheels K K, &c., in connection with the dray platform, substantially as described and for the purpose set forth.

4. The combination of the windlass P and its rope with the sheave R, for the purpose of drawing the cab on to the dray, substantially as set forth.

5. The combination of the windlass P with the sheave R^2, for the purpose of drawing the cab from the dray to the car, substantially as set forth.

6. The combination of the dogs M M M, &c., or their mechanical equivalents, with the platform of the dray or car, substantially as described and for the purpose set forth.

7. The combination of the hooks L L′, or their mechanical equivalents, with the platform, substantially as described and for the purpose set forth.

JOSEPH PAGE WOODBURY.

Witnesses:
WILLIAM EDSON,
FRANK G. PARKER.

DEFENDANT'S EXHIBIT Cv.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY AND SOLOMON S. GRAY, NO. 35,965, DATED JULY 22, 1862.

[PUT IN EVIDENCE, PAGE 462, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury, of West Roxbury, and Solomon S. Gray, of Boston, Massachusetts, have alleged that they have invented a new and useful improvement in Sabot for Feathered Projectiles, which they state has not been known or used before their application; have made oath that they are citizens of the United States, that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same

hath not, to the best of their knowledge and belief, been previously known or used; have paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph P. Woodbury and Solomon S. Gray, their heirs, administrators or assigns, for the term of seventeen years from the twenty-second day of July, one thousand eight hundred and sixty-two, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Joseph P. Woodbury and Solomon S. Gray, in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-second day of July in the year of our Lord one thousand [L.S.] eight hundred and sixty-two, and of the independence of the United States of America the eighty-seventh.

WATT J. SMITH,
Acting Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, Joseph P. Woodbury, of West Roxbury in the County of Norfolk and State of Massachusetts, and Solomon S. Gray, of Boston in the County of Suffolk and state aforesaid, have

invented a new and useful Improvement in Projectiles for Rifled or Smooth-bored Cannon; and we do hereby declare that the following is a full, clear and exact description of the construction and operation thereof, taken in connection with the accompanying drawings, making a part of this specification, in which —

Fig. 1 represents our Improved Shot, with the "Sabot" placed upon it ready for putting into the gun.

Fig. 2 represents the shot without the "Sabot."

Fig. 3 is an end view of fig. 1, and

Fig. 4 is an end view of fig. 2.

The subject matter of our invention relates to the manner of constructing and using winged projectiles for smooth-bored and rifled guns, and consists in employing with the same an elongated cylindrical "Sabot" made of paper pulp or other similar substance, which fills the spaces between the wings, and forms with the shot a solid cylindrical mass which fits the bore of the gun; which by its upsetting or compression endwise from the explosion of the gun, is expanded and fills the bore of the gun, and stops windage, and if rifled, takes the grooves and imparts rotation to the projectile. In the firing of obliquely winged shots, the tendency of the gases from the discharge in rushing past the wings of the shot is to put it in rotation in a direction opposite to that which would be imparted by the wings in passing through the air. When this takes place it prevents accurate firing. This is entirely prevented by the employment of a "Sabot" which entirely envelops the wings and excludes them from any such action of the gases. In the employment of a "Sabot" with a winged shot of the form shown where the wings are curved in a radial direction, there is a liability that the "Sabot," from the force of the discharge, will be so firmly compressed upon the shot that portions of it may adhere to the shot after it is discharged, and thus change its flight. To avoid this difficulty, the rear end of the "Sabot" which covers the rear end of the shot is made with a hole at the centre, which, in connection with other properties of construction to be hereafter explained, affords an adequate remedy.

In the drawings, A represents the body of the shot, which is made

of the form shown, with oblique curved wings for acting upon the air in its flight to give it rotation. The wings are made smaller in external diameter than the head of the shot, to permit the "Sabot" to entirely enclose them. B is a "Sabot" made of paper pulp or other similar substance, which in its interior is made of a form to fit on to the wings and rear part of the shot closely, and its exterior is made cylindrical, and of the proper size to fit the bore of the gun. At the rear end it is closed behind the wings, excepting the hole C, at the centre, and made of sufficient thickness to withstand the explosion of discharge as it rests against the rear extremities of the wings, and also against the shoulder D on the shot, at its forward end. The hole C in the "Sabot" serves to expose a part of the shot directly to the force of the charge, and relieves the "Sabot" of a portion of the pressure; it also serves to weaken that part of the "Sabot" in a radial direction, and enable it to break up into fragments more readily and detach itself from the shot; and it serves to apply the pressure of the gases to the same in an outward direction, which causes the "Sabot" to leave the shot with certainty at the instant of leaving the bore of the gun; thus leaving the shot absolutely free (and without rotation if fired from a smooth bore) to commence its flight. If fired from a rifled gun, the direction of the twist of the bore and of the wings should coincide.

What we claim as our invention, and desire to secure by letters patent, is the employment, in combination with a winged shot, of a "Sabot" externally cylindrical and fitting the gun, and enveloping and enclosing the wings, and made with a central aperture, C, for detaching the same, substantially as described.

Boston, February 6th, 1862.

JOSEPH P. WOODBURY.
SOLOMON S. GRAY.

Witnesses:
W. St. C. Redman,
Wm. C. Hibbard.
Ex'd. — E.A.M.

DEFENDANT'S EXHIBIT Cu. — D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 41,802, DATED MARCH 1, 1864.

[PUT IN EVIDENCE, PAGE 426, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury, of Boston, Massachusetts, has alleged that he has invented a new and useful improved construction of war vessels, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said invention, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said invention, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph P. Woodbury, his heirs, administrators or assigns, for the term of seventeen years from the first day of March, one thousand eight hundred and sixty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said invention, a description whereof is given in the words of the said Joseph P. Woodbury, in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this first day of March in the year of our Lord one thousand eight hundred

[SEAL] and sixty-four, and of the independence of the United States of America the eighty-eighth.

J. P. USHER,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

The Schedule referred to in these Letters Patent, and making part of the same.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and useful *Improvement in the Construction of War Vessels;* and I do hereby declare that the following is a full, clear and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which —

Fig. 1 is a midship section, and

Fig. 2, a "sheer plan" or side elevation.

Like parts are indicated by the same letters in both figures.

My improvement relates more particularly to what are known as "iron-clad," "armor-clad" or "plated" war vessels, the great practical objection to which is: 1st, If the armor-clad or plated sides and deck of such a vessel are raised but slightly (a foot or two) above the water level (as in the "Monitor" boats), it has not sufficient buoyancy for a good sea-going ship, and necessarily affords low, cramped, dark and unwholesome quarters for officers and crew; and 2d, If the armor-clad or plated sides and deck of such a vessel are raised sufficiently high above the water-line (10 feet, more or less), to afford the requisite sea-going qualities, the ship must be comparatively heavy crank, of deep draught, and necessarily very large and expensive.

The nature of my invention, therefore, consists in so constructing a war vessel as to have, while in action, all the advantages of

any iron-clad, armor-clad or plated vessel in use, and at the same time afford the requisite qualities for a good sea-going vessel, as well as storage room and healthy quarters for officers and men; which object I accomplish by making an invulnerable deck, raised a little (a foot or two) above the water level, the sides of the vessel being armor-clad or plated downward from said dack in the usual manner, and by continuing upward from said deck 10 feet, more or less, the sides and ends of the vessel to the upper or spar deck, of any suitable material (wood or metal), only sufficiently strong and thick to withstand the action of the sea, and presenting as little resistance as possible to shot and shell, while in action; the space between said invulnerable deck and the upper or spar deck affording the storage and necessary quarters for officers and men; thus making, in all respects, a perfect war vessel, offensive, defensive, seaworthy, comfortable and healthy.

My improvement further consists in combining with a vessel thus constructed a submarine gun or guns, substantially such as described in the patent granted to me by the United States of America, May 6, 1862, and numbered 35,193, to which more particular reference is made.

My improvement also further consists in combining with a vessel thus constructed a casemated battery or batteries, a turret or a revolving battery or batteries, such, for instance, as that described in the letters patent of the United States granted to John Ridgeway, October 21st, 1862, to which more particular reference is made.

To enable others skilled in the art to make and use my improvement, I will now proceed to describe its construction and operation.

A is the hull, constructed in the usual manner, of wood or iron.

B is the main deck, of sufficient strength to receive and support the deck armor or plating, and assist the same in resisting the impact of shot.

C is the side armor or plating, of any suitable material of sufficient strength to withstand the effect of shot and shell.

D is the deck armor or plating, of any suitable material of sufficient strength to withstand the effect of shot and shell.

E, E, are the sides of the vessel above the bomb-proof deck D,

of wood or metal, and of only sufficient strength to withstand the action of the sea, while they offer as little resistance as possible to the passage of shot and shell.

F is the upper or spar deck, of the same material as the sides E, E.

G is a bomb-proof casemate, a turret, or a revolving battery, of any description, as, for instance, the revolving battery patented in the United States by John Ridgeway, dated October 21st, 1862, and numbered 36,730, to which more particular reference is made.

H (fig. 2) represents a shot-proof pilot house, from which the whole vessel is directed and governed, being provided with an aperture to afford ingress and egress for the officers and crew at the top, which may be opened and closed, and from which pilot-house the submarine gun or guns can be directed to be fired by means of a speaking tube, or fired directly by the officer pulling a wire attached to the lock of the same. The pilot-house is also provided with "peep-holes" for observation, and furnished with pipes through which bad air is expelled and fresh air drawn in, by means of blowers, in the usual manner.

I (fig. 2) is a shot-proof smoke stock.

J is one of my submarine guns constructed and operated substantially as set forth in the letters patent of the United States granted to me May 6, 1862, and numbered 35,193, to which more particular reference is made.

My improvements may be applied to any kind of vessel propelled by steam or sails. I propose, however, to make use of four engineers, working in pairs, and boilers of large size, and twin propellers, one under each counter astern, of sufficient power to propel the vessel with great speed, or turn it quickly around at will.

The space between D and F is intended to be occupied by the officers and crew, except in time of action; the sides and top of which space, being built of light materials, and with sufficient lights and openings for ventilation, afford dry, healthy and comfortable quarters.

There should be constructed, just above the bomb-proof deck, scupper holes with suitable valves or stoppers, opening outward, of

sufficient number and size to free said deck from water in case that openings should be made by shot in action, so as to admit water in a rough sea; said valves and stoppers being so constructed as to open automatically outward by the pressure of water from the deck, and close automatically by the external pressure of the water.

In time of action, the berths, hammocks and other furniture may be carried below the bomb-proof deck, so that shot and shell may pass through and through the sides E, E, without doing any other damage than simply making holes, which can be readily stopped after the action is over. In time of action, the officers and crew are also in the bomb-proof tower, pilot-house, or below the bomb-proof deck.

I propose to use, on the spar deck, light, long-range rifled cannon, mounted on pivots *en barbette*.

Having thus described the construction and operation of my invention, what I claim as new and desire to secure by leters patent, is—

In a vessel constructed with a vulnerable upper deck and sides above an invulnerable lower deck and plated bottom, I claim resting a battery or batteries immediately on or below said invulnerable deck, substantially as and for the purpose described.

JOSEPH P. WOODBURY.

Witnesses,

N. AMES,

JAS. F. ELLIS.

Ex'd—S.P.P.

DEFENDANT'S EXHIBIT Ct.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 46,043, DATED JANUARY 24, 1865.

[PUT IN EVIDENCE, PAGE 426, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury, of Boston, Massachusetts, has alleged that he has invented a new and useful improvement in street steam railway cars, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Joseph P. Woodbury, his heirs, administrators or assigns, for the term of seventeen years from the twenty-fourth day of January, one thousand eight hundred and sixty-five, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Joseph P. Woodbury in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-fouthr day of January in the year of our Lord one thousand eight [SEAL] hundred and sixty-five, and of the independence of the United States of America the eighty-ninth.

J. P. USHER,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and useful improved street steam railway car; and I do hereby declare that the following is a full, clear and exact description of the construction and operation of the same, reference being had to the accompanying drawings forming a part of this specification, in which —

Fig. 1 is a side elevation of one of my cars.

Fig. 2 is a horizontal section on the line *y* of fig. 1.

Fig. 3 is a longitudinal vertical central section through the engine room and a part of the car in the line *x*, *x*, of fig. 2.

Fig. 4 is a horizontal section in the line *x* of fig. 1.

Fig. 5 is a plan of the circular platform and truck frame, showing the anti-friction rollers in the line *x* of figs. 1 and 7.

Fig. 6 is an enlarged longitudinal vertical section through one of the anti-friction rollers, with its frame and the track or groove in which it traverses.

Fig. 7 is a side elevation of the boiler and engine room and a part of the car, representing the engine and boiler room as partially independent of the car; the car being attached to the centre pin of the engine room and engine truck frame by connecting bars at the top and bottom, so that the engine room may partially revolve within a part of the front end of the car, or as much as is necessary to follow the curved tracks.

Fig. 9 is a horizontal section in the line Z of fig. 7, showing the connecting bars connecting the top of the car with the centre pin at the top of the engine and boiler room.

Fig. 8 is a horizontal section in the line *y* of fig. 7.

Fig. 10 is a horizontal section in the line *y* of fig. 7, representing the boiler room and truck frame elongated (they may be square-cornered or circular in front), in order to give more space for the engine and boiler if required.

Like parts are indicated by the same letters in all the drawings.

The nature of my invention consists in certain improvements in the construction of what are known as "dummy engines" or "street steam railway cars," whereby they are enabled to run with perfect ease and freedom round the shortest curves that ever occur in any street or other railway tracks.

To enable others skilled in the art to make and use my improvements, I will now proceed to describe the construction and operation of the same:

The car is divided by the partition C into two compartments, A and B. The rear and larger compartment A (provided with seats X, X, X, as shown in fig. 2) is the passenger room. The front and smaller compartment B is the engine and boiler room, or rather the shell or cover in and under which the forward truck, with the engine and boiler, moves horizontally around a centre pin, as the curvature of the railway track may require. The general construction of the body of the car, with the above exception, is substantially like that of other railway cars in common use.

The car rests upon two four-wheel trucks, E and I (as represented in fig. 1), the wheels of which are fast to their axles. The front and rear wheels of the truck E are disconnected, so that the two sets may turn independently of each other; but the front and rear wheels L and M of the truck I are united by two connecting rods, N, in the manner of locomotive engine wheels, so that both sets of wheels must turn together in order to secure the requisite traction.

D is the passenger platform.

O O are the brakes of the engine truck, under the control of the engineer and conductor.

G G are the brakes of the rear truck, and H is the crank shaft by which they are operated.

I is the framework of the engine truck, of wood or iron, to the under side of which, as seen in fig. 3, are attached the hangers S, which are provided with suitable boxes for the axles J and *k* to turn in, T T, being the rubber springs in general use. On the top of this truck frame I is firmly secured a circular track or way, *i*, as represented in fig. 5. This track *i* may be a separate piece or pieces, or cast in one with the truck frame I.

g g are two vertical flanges extending round the outer and inner edges of the circular track *i*, as shown in figs. 5 and 6, forming between them a groove in which traverse the anti-friction rollers *h*.

j j are two concentric rings between which the rollers *h* are arranged, as represented in figs. 5 and 6, to turn upon their axles *k k*, whereby they are kept at a fixed and proper distance apart (by fixed studs *h' h'*, as shown in fig. 5), the rings and rollers forming in effect a circular carriage. These rollers, in order to traverse on the circular track with perfect freedom, should be slightly conical, *i.e*, the opposite sides of a longitudinal central section through one of them should be described by two radii of the circular track itself. In some cases, however (as in figs. 7, 8, 9 and 10), in place of this travelling circular carriage, I propose to make use of friction wheels turning on axles fixed either in the bottom of the car (where it rests upon the engine truck frame), or in the top of the engine truck frame, directly under the car frame (where the circular end rests on the engine truck frame).

W is a suitable platform or covering of wood or metal, placed upon the truck I, inside of the circular track, and forming a floor for the engine, boiler and engineer.

a is an upright boiler which rests (as shown in figs. 2 and 8) upon the platform W.

b is the smoke stack and exhaust pipe, so bent as to pass through a circular opening in the top of the car, directly over the centre pin V; which opening is also large enough to allow the pipe to turn with freedom when the truck and boiler turn upon said centre pin.

c c are a pair of oscillating engines, whose piston rod *d d* are con-

nected with the crank axle J of the driving wheel L, as shown in fig. 4, and are suspended by means of a framework under the engine-room floor in any obvious manner.

S is the steam pipe leading from the boiler to the engines, and *e e* are the valve rods.

The general inclination of the engines is indicated by the piston rods *d d* in fig 1. They should be as nearly horizontal as possible, and not interfere with the front axle of the truck.

The drawings represent oscillating engines; any other engine may be used, however, if desired.

Thus it will be seen that the engine and boiler rest entirely upon the forward truck I, and that all three of them are entirely independent of the main body of the car, and are capable of moving independently of it in a horizontal plane, as will appear from the description which I am about to give of the devices by means of which the car and truck are connected together.

P P are the two outer bottom sills of the car, which are continued beyond the main body A, as shown in fig. 4, so as to form the foundation of the engine-room B.

Q is the centre beam of the car bottom, and R is the cross-beam uniting the two side sills directly under the partition C.

To the under side of the sill P of the engine room B is attached a circular track, whose diameter is the same as that of the circular track *i*, with which it is intended to be concentric. Thus it will be seen that one half of the weight of the car will rest upon the anti-friction rollers *h*.

V is a stout connecting bar of flat iron or steel, the back end of which is attached to the beam Q, by the bolts *l l*, while the front end is continued a little beyond the centre of the engine-room, as shown in figure 3.

U is a strong bolt or linch-pin, which passes up through the connecting bar V, and the flow W, of the truck I. This bolt U is prevented from having any lateral motion by means of two arms or continuations of the connecting-bar V, extending to the two sills P P, as represented by dotted lines in figure 4. I also propose to make use of friction wheels *m*, arranged on vertical axes, around

the circular floor of the engine-room, as shown in figure 2, in such a manner that they shall bear against the edge of the circular hole in the bottom of the room B, and thereby remove a great deal of the strain that would otherwise come upon the pin V. I also propose to rise similar friction wheels *m*, at the top and bottom of the car, where the engine-room and passenger-room unite, as represented in figures 8, 9 and 10.

Thus it is obvious that the truck I which carries the engine and boiler will draw the car, and at the same time be free to turn independently of it in a horizontal plane, and thereby enable the car, however long it may be, to move with freedom round the shortest curves.

The rear truck E, I also propose to furnish with anti-friction rollers and a truck, in the same manner as the truck I, and attach it to the bottom of the car by means of a centre pin, similar to V.

Figure 7 represents a slight modification of the principle of connecting the engine-room with the main body of the car, in which modification the engine-room is circular and only partially surrounded by the front of the main body of the car, as more clearly shown in figures 8 and 9.

Figure 10 also shows another modification of the engine-room to afford more space for the boiler and engines in case larger and more powerful ones are required.

n n represent water-tanks, and *r r* coal bunkers. The space under the seats of the passenger-car may also be used for water-tanks if required. The passenger-car may be heated by means of pipes leading from the boiler or exhaust pipe.

In case my steam car should be needed to carry freight instead of passengers, I propose to use the style of engine truck frames shown in figures 7, 8, 9 and 10, in order that it may have room for a boiler or boilers large enough to do the work required. In some cases it may also be desirable to disconnect this engine from one car and connect it to another of a similar construction, which can be readily done by withdrawing the centre pin U, having previously placed under the car a hand-truck or jack to keep the car in position while the

engine is being removed. It is also obvious that a car to be used for freight alone would require neither seats nor windows.

I propose to make a removable box or casing of sheet metal around and under the engines and working machinery below the floor of the engine-room, with suitable doors or openings for oiling or inspection, this casing to protect the machinery from dust and prevent it from frightening horses or other animals on the highway. I propose to construct my locomotive truck frame and springs, and also the truck frame and springs at the rear end of the car, on the plan of any of the known varieties of construction, with a centre bearing where the weight of the car rests on the lower frame crosswise, at nearly right angles with the railway track, in a manner well known to mechanics, so that while the upper frame and radial anti-friction rollers and the lower circular rail shall always be kept up in close contact with the rail on the under side of the locomotive or car body, the lower and independent frame may vibrate or oscillate longitudinally and vertically with the railway track with perfect freedom to accommodate itself and follow all of the undulations in the railway track.

Having thus described the construction and operation of my invention, what I claim as new and desire to secure by letters patent is—

First, the combination of the boiler and engine of a locomotive with a car truck, provided with a circular truck frame and anti-friction rollers, so adjusted as to be received within one end of a car, so that the truck can turn independently of the car, in the manner and for the purpose herein set forth.

Second, the combination of one end of a railway car with an independent circular locomotive car truck, when constructed in the manner and for the purpose herein described.

Third, constructing the truck I, with a circular track *i*, provided with anti-friction rollers *h*, to support the ward portion of the car and allow the truck to turn with freedom under it, substantially as described.

Fourth, the independently circular carriage of radial anti-friction rollers to operate in combination with the top of the truck and the bottom of a railway car, substantially as described.

Fifth, connecting the car to the centre pin of the truck frame at the bottom by means of a connecting bar V, substantially as described.

Sixth, the employment of a centre pin and connecting bar to connect the top of the car with the top of the engine and boiler truck, substantially as shown in fig. 9.

Seventh, forming the front of the passenger car concave, and the engine and boiler room convex and circular, so that the one may turn in the other, substantially as represented in figs. 7, 8, 9 and 10.

Eighth, making the rear truck to turn on a centre pin in the rear end of the car body in combination with the circular tracks and carriage of radial anti-friction rollers which support the car body on the truck, substantially as described.

Ninth, the anti-friction wheels *m* to operate in combination with the revolving engine room and passenger car, substantially as described.

Tenth, so constructing and arranging the smoke and exhaust pipe as to pass through the top of the car, directly over the centre pin U, wherever the boiler is placed, so that when the truck frame turns on a curve said pipe may also turn with freedom through the car top, substantially as described.

JOSEPH P. WOODBURY.

Witnesses:

H. W. Brooks,

N. Ames.

Ex'd — H.H.

DEFENDANT'S EXHIBIT Cs.—D.B.H., Special Examiner.

CERTIFIED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JOSEPH P. WOODBURY, NO. 41,883, DATED MARCH 8, 1864.

[PUT IN EVIDENCE, PAGE 426, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Joseph P. Woodbury and N. Ames, of Boston, Massachusetts, have alleged that they have invented a new and useful improvement in automatic railroad switch, which they state has not been known or used before their application; have made oath that they are citizens of the United States, that they do verily believe that they are the original and first inventors or discoverers of the said improvement, and that the same hath not, to the best of their knowledge and belief, been previously known or used; have paid into the treasury of the United States the sum of thirty-five dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtainin gan exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Woodbury & Ames, their heirs, administrators or assigns, for the term of seventeen years from the eighth day of March, one thousand eight hundred and sixty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Woodbury and Ames in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this eighth day of March in the year of our Lord one thousand eight hundred [SEAL] and sixty-four, and of the independence of the United States of America the eighty-eighth.

J. P. USHER,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

D. P. HOLLOWAY,
Commissioner of Patents.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, Joseph P. Woodbury and N. Ames, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and useful automatic railroad switch; and we do hereby declare that the following is a full, clear and exact description of the construction and operation of the same, reference being had to the accompanying drawings forming a part of this specification, in which —

Fig. 1 is a side view of a horse railroad car with our improvements attached, representing one of the pendent arms depressed so as to act upon the central rail or guide W.

Fig. 2 is a plan of two tracks, a straight track *x x*, and a turnout *y y*, and

Fig. 3 is a section representing another method of confining the pendent arms in a perpendicular position.

Like parts are indicated by the same letters in all the drawings.

The nature of our invention consists —

First, in attaching a pendent or depressible arm permanently to the longitudinal centre of the car-wheel axle, so that the latter may revolve in the former, as a shaft in its bearing.

Second, in combining with said arm permanently attached to the axle, either a horizontal roller F, or a vertical roller G, to operate on the concave side of a central guide rail W, whereby the car may

be guided, or switched from one track to another by a person standing on the platform.

Third, holding said arm in a perpendicular position by means of a start *e*, operating in combination with links U U, or a cleat H, attached to the bottom of the car by bolts *so small* that in case the foot of the arm should come in contact with any immovable or insurmountable obstruction, said bolts will break, and thereby prevent the axle or other parts of the car from being seriously injured.

Fourth, connecting together and raising said pendent arms by means of a single spring L.

Fifth, placing the central guide rail on a metallic or wooden platform or bed, extending some distance beyond it at either end and on the concave side, so that the rollers on the depressible arm may slide or roll over it, instead of touching the ground; and

Sixth, in the combination of a windlass J and chain I with said pendent arm, whereby the latter is depressed by a person standing on the platform of a moving car.

To enable others skilled in the art to make and use our invention, we will now describe its construction and operation:

A is a car, resting on the axles B B of the wheels (shown in dotted lines) in the usual manner.

D is a cast-iron box (either round or made in halves bolted together), in which the axle B revolves, said box being kept in the centre of the axle (see fig. 2) by means of pins, collars held with set screws, or their equivalents.

d is a round arm, or combination of the box D.

F is a horizontal roller, which turns on an axle fast in the arm *d*, as represented by the dotted line in figs. 1 and 2; or said roller may be provided with a fixed shank, axle or continuation, which may revolve in the arm *d*.

G is a vertical roller or wheel, which turns on a pin or axle in the arm *d*, as represented in fig. 1. The same style of rollers should be used on both ends of the car, or the width of the vertical roller should be the same as the diameter of the horizontal one. On some railroads the horizontal wheel will be preferable, and on others the vertical, owing to peculiar construction and location.

e is a start on the box D, directly opposite the arm *d*, the object of said start being to hold the pendent arm *d* in a perpendicular position, which it does by bearing on the cleat H, as shown in fig. 1.

The cleat H is a bar of iron bent at right angles, and is intended to be attached to the bottom of the car by means of bolts (for an ordinary car), about three eighths of an inch in diameter, or so small as to be cut off or broken by any unusual obstruction, as and for the purpose described above in setting forth the nature of our invention.

In place of the cleat H two links U U may be used, one attached to a stud S on the bottom of the car, and the other to the start *e*, as represented in fig. 3. When the arm *d* is in a horizontal position, the contiguous ends of the links U U will be depressed. The links are united by small pins, so as to break when required.

I is a chain or its equivalent, one end of which is fast to the box D and the other attached to the windlass J, as represented in fig. 1.

K is the handle of the windlass J, by turning which a person standing on the platform of the car can instantly depress, and bring the arm *d* into a perpendicular position, as shown in fig. 1 (at F).

L is a spiral spring stretched between the boxes D D or the starts *e e*, as shown in fig. 1, the object of said spring being to hold the arms *d d* in a horizontal position, when not depressed by the chain and windlass, for the purpose of bringing the rollers F and G to bear upon the concave side of the central guide rail W.

The guide rail W is placed the semi-diameter of the wheel F to one side of the centre of the track, as shown in fig. 2, and its concave side is parallel with the turnout rails Y Y. The top of this rail W is intended to be about one inch and a half above the other rails of the track, and is confined to the top of the bed piece V of wood or iron, smooth or corrugated, which extends beyond it, W, as shown in fig. 2, and for the purpose specified above.

The drawing fig. 2 represents a right-hand turnout. It is obvious, however, that the central rail W may be curved in the opposite direction, and applied equally well to a left-hand turnout.

The tendency of a car is always to move in a straight line; but when it is required to be switched from the straight track to the turnout, it is only necessary for the driver, or a person on the plat-

form, to turn the windlass J at the proper time, so as to bring the arm *d* into a perpendicular position, when it is obvious that the wheel F (fig. 1, for instance), rolling on the concave side of W, will direct the car on to the turnout Y Y, thus obviating the necessity of employing a switchman stationed to operate each separate switch.

Having thus described the construction and operation of our invention, what we claim as new, and desire to secure by letters patent, is —

First, attaching a pendent or depressible arm permanently to the longitudinal centre of the axle, substantially as set forth, and for the purpose described.

Second, combining with the arm *d*, permanently attached to the longitudinal centre of the axle, either a horizontal or vertical roller F and G, substantially as and for the purpose described.

Third, holding the arm *d* in a perpendicular position by means of the start *e*, or its equivalent, in combination with links, or a cleat, attached to the bottom of the car by bolts, so small as to break when required, substantially as described.

Fourth, connecting and raising the two arms *d* and *d* by means of a single spring, substantially as described.

Fifth, the combination of the windlass J, chain I and box D, substantially as and for the purpose set forth.

JOSEPH P. WOODBURY.
NATHAN AMES.

Witnesses:
JAS. F. ELLIS,
JAS. AMES.

Ex. — J.A.W.

DEFENDANT'S EXHIBIT Cr.—D.B.H., Special Examiner.

CERTIFED COPY OF LETTERS PATENT OF THE UNITED STATES, GRANTED JAMES A. WOODBURY, NO. 11,984, DATED NOVEMBER 21, 1854.

[PUT IN EVIDENCE, PAGE 426, VOL. 1.]

THE UNITED STATES OF AMERICA,

To all to whom these Letters Patent shall come:

Whereas Harvey Snow, of Dubuque, Iowa, has alleged that he has invented a new and useful presser-bar for planing machines (he having assigned his right, title and interest in said presser-bar to James Woodbury, of Winchester, Mass.), which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said presser-bar, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said presser-bar, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said James A. Woodbury, his heirs, administrators or assigns, for the term of fourteen years from the twenty-first day of November, one thousand eight hundred and fifty-four, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said presser-bar, a description whereof is given in the words of the said Snow in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent Office has been hereunto affixed.

Given under my hand, at the city of Washington, this twenty-first day of November in the year of our Lord one thousand eight hundred and fifty-four, and of the independence of the United States of America the seventy-ninth.

[SEAL]

ROBERT McCLELLAND,
Secretary of the Interior.

Countersigned, and sealed with the seal of the Patent Office.

C. MASON,
Commissioner of Patents.

The Schedule referred to in these Letters Patent, and making part of the same.

Be it known that I, Harvey Snow, of Dubuque in the State of Iowa, formerly of Lowell in the County of Middlesex and State of Massachusetts, have invented a new and useful improvement on a machine for dressing boards and other material.

Figure 1 is a top view of the machine. The frame A is made of wood or iron, with two sides, two legs on each, connected by the platen B, as shown in figure 2, made of wood or iron of sufficient strength to keep the machine all stiff and true; also it is made to support the cutter cylinder, pressure-bar and roller, springs, &c., being a very cheap method of construction.

C is a rotating two-knife cutter cylinder, not differing very much from those in common use, except being all cast, or may be cast, upon a wrought-iron or steel shaft, which makes much less expense than fitting them together in the usual way.

D D are feed rollers, driven in the common way, by pulley and pinion, geared to the small roller, the small roller being fluted and less than half the size of the large one; which is an improvement over the common method of making them both of equal size, thereby giving a strong grip to the board, and making it less necessary to gear the two rollers together; for it must be seen that the large roller will turn more readily on its centre when acted upon by a small roller, giving a more powerful and effective moving pressure than can be so easily obtained by using two rollers of equal

size, thereby saving the expense of coupling gears and giving to the machine a more simple working action.

G G are guards placed on the round part of the boxes, which hold the cutter C and made so as to move freely on said boxes; and are made a little larger diameter than the cutters, so as to keep clear of the edge of the knife, and so fixed as to make it nearly impossible for the bar and roller, which hold the board, to come in contact with the cutters when in use. They also may be used to connect the bar and roller, as shown in figures 3 and 4 in the accompanying drawings.

F F are links to connect the bar and roller, which are fixtures to hold the material while being planed, and may be used in connection with the guards G, or may be dispensed with, and the guards G used in their stead, as shown in figures 3 and 4.

H is a concave bar which lies parallel with the cutters, and on the feed, inside of the machine, and is connected with the central part of the cutter cylinder by the links F or by the guards G, as may be thought best, and so arranged as to rise and fall with the variation of the thickness of the material so as to reduce the same to an uniform thickness, always keeping the thin or inner edge of the bar at an equal distance from and as close as practicable to the edge of the cutters; and serving as a mouth-piece to protect the material from splitting and breaking out, and holding the knots so that they will not be taken out by the lifting action of the cutters; thus compelling the pressing or inner edge of the mouth-piece next to the cutters to remain under all circumstances at the same distance from the path of the cutting edge of the knife; being thus adapted to plane very thin materials.

I is a roller to keep the material steady, and connected in the same manner as the bar H, as above described, or a bar may be used in its place like H, if thought best. E is a roller to ease the material as it passes into the machine. All the other parts as shown in the accompanying drawings are so common as not to need further description.

What I claim is, combining the pressure-bar H with the rotary cutters, so as to secure the same relative position of the inner edge of

the bar and the part of the cutting edge in holding and cutting the surface of a board throughout its varying thickness, substantially as described.

HARVEY SNOW.

Witnesses:
WILLIAM ANDREW,
J. H. THEDINGA.
Exd.—H.H.

DEFENDANT'S EXHIBIT Cq.—D.B.H., Special Examiner.

TRANSLATION BY MAX AURBACH, OF THE FRENCH LETTERS PATENT GRANTED M. ROGUIN, MARCH 15, 1817.

[PUT IN EVIDENCE, PAGE 427, VOL. 1.

Copy of the Patent of Mr. Roguin (Louis Victor Joseph Marc), residing at Paris, at No. 67, Rue du Faubourg Montmartre, dated March 15, 1817, for a "machine fit for working woods of every kind and of all dimensions."

DESCRIPTION.

The title of this memoir might cause some error concerning its contents, unless we hastened to give notice that we have not to occupy ourselves with the operations wood is made to undergo, until the moment that, reduced to joists and planks more or less thick, it is given up to commerce for the needs of consumption.

There is no one but knows for how many purposes wood is employed; and yet this material, so common and so abundantly furnished us by nature, is not yet generally enough utilized; and among the many objects for which it would be useful to employ it, I

will content myself with naming those deadly floors of baked clay for which it would be so desirable that wood might be substituted.

The principal cause that until the present moment has prevented a more general employment of wood, is the cost of its workmanship. To reduce this very much, and thereby put the habitual use of wood within the reach of the greatest number, will be the result of the new processes, a description of which the inventor will now make.

The working of wood, whatever may be the use for which it is designed, can be reduced to four principal operations; these are —

1st. The planing of it.

2d. The making of tongues and grooves to join the wood.

3d. The making of mouldings to serve as an ornament.

4th. The making of tenons and mortises to put together the work.

This last operation is not capable of being done by a machine, since the place of the tenons and mortises depends on the length of the pieces that form the frame, and this length itself depends upon the dimensions of the whole work; but the first three operations can be performed and are really executed by the machine, as can be seen upon the plan. A plank *a a* is submitted to the action of the machine; the portion in *a* is planed, the portion in *b* has received a moulding composed of a doucine between two squares. Two planks, placed on edge, *y y* and *z z*, have been simultaneously subjected to the action of the machine; they have received, the first a groove in *y*, the other a tongue in *z*.

Description of the Machine.

This machine is composed as follows: —

A bench or framework in two parts; one fixed (A); the other, which I call the *carriage*, is movable (C); this carriage, borne upon six small wheels (see its elevation on the sheet on which the tools are sketched), rolls on a projecting part which I call *cornice* (B). This movable carriage will itself have a movable bottom which, by means of screws placed from above downwards in the thickness of the wood which forms the frame of the said carriage, will be raised or lowered, according as it shall be required by the greater or less thickness of the wood submitted to the action of the machine. I

have dispensed with the executing of these details in the machine that I am describing, because wood of a single thickness was sufficient for making my trials.

This carriage is drawn by a windlass, whose axis bears at its extremity a wheel (M) that gears into a pinion (N); a winch (R) is placed at the extremity of the axle of this pinion.

Upon the fixed part of the bench or frame is placed an iron arbor (S), terminated by gudgeons or bearings, which turn between copper cushions enclosed in iron supports (F); the extremity of the arbor bears a pinion (G) into which gears the large wheel (J) put in motion by the winch (R).

The arbor bears the tools to which I give the name of planes; these tools are cylindrical; they have a greater or a smaller diameter and more or less thickness, according to the effect they are to produce. The blades with which these cylinders are furnished are set in the thickness of the iron; they are cut obliquely.

In the middle of the cylinder is a square hole into which the arbor enters; the tools are fixed upon the arbor by small pins.

(t) is a grooving plane whose office it is to make the groove executed in y.

(u) is a combination of two grooving planes designed to make a tongue that is shown executed in z.

(v) is a plane, properly so called, whose sole office it is to plane the wood.

(x) is a combination of three planes, representing a doucine between two squares.

All these tools are drawn of natural size on the sheet numbered 2.

Working of the Machine.

If the carriage, drawn by the windlass, passes over say five millimetres in a second, the plane, carried by the arbor that is set in motion by the wheel J, makes, in the same time, ten turns upon itself (the teeth of the pinion are to those of the wheel as 1 to 10); now, this plane being fitted with eighteen blades, it happens from the combined movements of the tool, and of the wood submitted to its action, that one hundred and eighty blades act successively upon

a length of five millimetres of wood, which, on account of the slow, regular and progressive motion of the carriage upon which it is placed, offers successively to each blade a new particle of wood to be taken away.

In the trial machine of which I give the plan, the moving forces are men's arms; if it were constructed with the force necessary to resist a moderate effort, it would not have enough to overcome the resistance that would be offered to the tool by the wood it would have to cut away if the carriage had a more rapid progressive motion. Thus, in this trial machine, I lose in time what I gain in force; or, to speak more exactly, the time that I lose spares me an expenditure of force.

It will not be thus in the machine constructed of full size; the moving forces that I employ on a small scale will be replaced by a single motor (horse or steam engine); the tools, having a greater diameter, will be able to be furnished with more blades; and, master of the force to be given to the motor, I shall be able, by accelerating the movement of rotation of the tools, to accelerate proportionably the progressive movement of the carriage.

The return of the carriage, by one of the many means offered by mechanics for changing a continuous circular motion into an alternate rectilinear motion, will cause a considerable loss of time; since the time employed in the return of the carriage should be equal to that spent in going. I propose to utilize this return in the working of the large machine, and to lose, by a suspension of the motion, only the time necessary to turn over or to change the wood.

For this purpose a second arbor will be placed after the first; it will carry on its extremity a wheel of the same size as the pinion of the first, which, gearing into this pinion, will turn, and will cause the second arbor to turn in a contrary direction to the first. In order that the tools carried by this second arbor may not stop the wood in its first motion *of going*, this second arbor will be carried by hinged supports, so that it can be raised or lowered at will.

By this very simple means, the two motions of going and of coming of the carriage are utilized; and there is lost, as I have already said, only the time necessary to turn over or to change the wood.

I suppose it is needless to say that the employment of another motor will change the arrangement of the wheels in the construction of the full-sized machine; as for the rest, the wheels and the motors, well-known means, are only accessories of this machine.

Done at Paris, February 16, 1817.

(Signed,) ROGUIN,
No. 67, rue du Faubourg Montmartre.

EXPLANATION OF THE FIGURES.

Sheet marked A.

Plan, Fig. 1. Elevation, Fig. 2.

A, Fixed part of the bench or framework.

B, Cornice on which the carriage runs.

C, Carriage.

D, Ropes that draw the carriage.

E, Wooden frame which bears one of the supports, H, of the wheel J, and one of the supports, F, of the arbor S.

G, Pinion into which the wheel J gears.

H, Supports of the wheel J.

J, Wheel that gears into the pinion G.

K, Winch.

L, Wooden or iron bar called the guide.

M, Wheel of the windlass.

N, Pinion into which the windlass wheel gears.

P, Axle of the windlass, around which run the ropes that draw the carriage.

Q, Support of the pinion into which the wheel of the windlass gears.

R, Winch of the windlass.

S, Iron arbor that carries the tools.

t, Groove plane that makes a groove.

u, Combination of two groove planes, forming a tongue by the space they leave between them.

v, Plane, properly so called, employed solely for planing wood.

x, Combination of three planes forming a moulding, composed of a doucine between two squares.

yy, Plank placed edgewise in the carriage, and which comes out from under the tool with a groove in *y*.

zz, Plank similarly placed, and which comes out from under the tool with a tongue in *z*.

aa, Plank placed flat upon the carriage, and which comes out from under the tool planed in *a*, and with a moulding in *b*.

Sheet numbered 2.

Projection of the tools, natural size.

1, Elevation of the plane.

2, Plan of the plane.

3, Combination of two grooving planes, leaving between them the space of a tongue.

4, Grooving plane for hollowing the groove.

5, Plane designed solely to plane the wood.

6, Combination of three planes forming a moulding, composed of a doucine between two squares.

7, Iron arbor that carries the tools.

A Z, Elevation of the carriage on the scale of the plan of the machine.

Paris, February 16, 1817.

(Signed,) ROGUIN,
No. 67, *rue Faubourg Montmartre.*

A true copy.

General of Division, Director of the
Conservatory of Arts and Trades,

(Signed,) MORIN.

(The signatures properly certified.)

DEFENDANT'S EXHIBIT Cp. — D.B.H., Special Examiner.

TRANSLATION BY MAX AUERBACH, OF THE CERTIFICATE OF ADDITION TO THE LETTERS PATENT GRANTED M. ROGUIN ABOVE REFERRED TO, MARCH 30, 1818.

[PUT IN EVIDENCE, PAGE 427, VOL. 1.]

Copy of the addition made to the patent of Mr. Roguin (Louis Victor Joseph Marc) March 15, 1817, for "a machine to work wood," by Mr. Roguin, Louis Antoine Gabriel, living in Paris, street and Hotel Vivienne, No. 14.
Dated March 30, 1818.

DESCRIPTION.

The machine for which my father, Mr. Roguin (Louis Victor Joseph Marc) obtained, March 15, 1817, a patent, was susceptible of improvements which he had partly indicated in the description sent in, in support of his demand. These improvements have been adopted in the construction of the full-sized machine, the plans, elevation, profile and details of which I join herewith:

The fundamental idea of the first machine could not vary; this fundamental idea consisted in subjecting wood to the action of a tool of a particular form, and of impressing upon this tool a rotatory movement; but there was the choice either to fix the tool, and to cause the wood to advance under it by a slow and progressive movement, or to impress at the same time upon the tool two motions, one of rotation, the other of progression. The first method was chosen in the construction of the machine described in support of the petition for a patent; we have adopted the second in the construction of the perfected machine.

In the first machine, the tool was a cylinder of iron, in the thickness of which the blades were set. For this cylinder we have substituted a core (30) of cast iron, upon which the movable blades

(35, 36, &c.) are held in a jaw whose lower part is fixed and belongs to the core, and the upper part is movable (33). These blades are pressed between these two jaws by the adjusting screws (34) that are shown upon the movable part of the jaw. Upon the lower part of the jaw are fixed small steel blades, which perform the office of the second iron of two ironed planes. Experience has proved that this precaution is indispensable in order to avoid a very grave inconvenience, that of splintering the wood when the fibres go in different directions, which happens very often; above all, around knots.

The tool is carried by a carriage (19) of cast iron, and to the posterior part of this carriage is fixed an iron axle (18), which bears two pinions of copper (17) that gear into the toothed rack (16) and serve to regulate the movement of the carriage.

The table (21) moves vertically by means of the screws (29) that support it, and serve to raise and to lower it according to the thickness of the wood to be worked. Four small plates of metal, graduated, are placed at the interior angles of the frame (*bâti*), and serve as regulator, to put this table in a perfectly horizontal position.

Two iron knees (27) abut against the table at the two extremities. Experience has shown that the weight of the table was not alone sufficient to prevent the vibration given to it by the machine in motion; and there resulted from this vibration waves on the surface of the planed wood; this means has made them disappear.

The carriage (19) is of cast iron, and weighs, including the tool, about 110 kilos. It is necessary that this carriage should have such a weight as not to be lifted up by the effort of the tool upon the wood; an effort, however, far less considerable here than in the first machine described, since in that the cutting edge of the tool was perpendicular to the axis, whilst the bevel of the new tool is almost tangent to the circumference.

The pulley (3) receives motion from the motor; it carries along the large pulley (4) which is adherent to it. The latter communicates motion to the tool by means of the pulley (5) enveloped by the rope that is sent back by the return pulley (6).

The axle (28) carries on its extremity a copper pinion (7), into which gears an iron toothed wheel (8); to this wheel adheres a pul-

ley (9), which, by means of the rope that envelops it, communicates motion to the carriage by the pulley (10) fixed to the extremity of the axle (18); the rope, after having passed over this last pulley, returns by the return pulley (11).

The posterior part of the table carries a claw (23), against which the wood is thrust and stopped as upon carpenters' tables. At the other extremity the wood is stopped by movable claws (24) which pass under a stay (25) traversed by adjusting screws (26).

The carriage is rapidly brought back to its point of departure by means of the ratchet wheel and the catch placed between the toothed wheel (8) and the pulley (9).

It is seen in the description of the first machine, that the piece named *guide* (because it really serves to guide the wood under the tool to make the grooves, tongues and mouldings), was fixed upon the frame of the bench (*établi*).

In the new machine this piece is supported through the carriage.

Paris, February 27, 1818.

(Signed,) LS. ROGUIN (Louis Antoine Gabriel),
Street and Hotel Vivienne, No. 14.

Nomenclature of the Constituent Portions of the Machine, with the Figures of Reference.

No. 1, Frame of the bench (*établi*).

2, Prolongation of the frame carrying the axle No. 18, the toothed wheel No. 8, and the pulley No. 9.

3, Pulley that receives motion from the motor.

4, Large pulley adherent to that No. 3, and communicating motion to the tool.

5, Pulley of the tool.

6, Return pulley.

7, Pinion placed at the extremity of the axle No. 28 of the pulley of the motor.

8, Toothed wheel receiving motion by means of the pinion No. 7.

9, Pulley adherent to the toothed wheel, and communicating motion to the next following pulley.

10, Pulley fixed to the axle (No. 18) of the pinions of the carriage (see the plan).

11, Return pulley.

12, Cross-pieces into which pass the screws (No. 29) that support the movable table (see the profile).

13, Rope of the motor.

14, Rope communicating motion to the pulley of the tool.

15, Rope communicating motion to the pulley of the carriage.

16, Toothed racks.

17, Pinions that gear into the toothed racks to regulate the motion of the carriage.

18, Axle of the pinions and of the pulley No. 10.

19, Carriage.

20, Tool.

21, Table movable vertically.

22, Wood submitted to the action of the tool.

23, Claw.

24, Movable claws.

25, Stays of the claws.

26, Adjusting screw of the claws.

27, Knees abutting against the movable table.

28, Axle of the pulleys Nos. 3 and 4, and of the pinion No. 7.

29, Screw giving the vertical motion to the table.

30, Core of the tool.

31, Iron pressed into a jaw, the upper lip of which is movable.

32, Steel blade fixed upon the lower jaw performing the office of the lower iron of two ironed planes.

33, Upper lip.

34, Adjusting screw.

35, Planing iron.

36, Grooving iron.

37, Tonguing iron.

38, Moulding iron.

Paris, February 27, 1818.

(Signed), LS. ROGUIN (Louis Antoine Gabriel),

Street and Hotel Vivienne, No. 14.

True copy.

DEFENDANT'S EXHIBIT Ce. — D.B.H., Special Examiner.

NOTICE OF A MEETING OF THE BOSTON ASSOCIATION OF PLANERS DATED APRIL 2, 1859.

[PUT IN EVIDENCE, PAGE 443, VOL. 1.]

ROOM 15, MERCHANTS' EXCHANGE,

BOSTON, April 2, 1859.

SIR:

A regular meeting of the Boston Association of Planers will be holden at room 15, Merchants' Exchange, Boston, on Wednesday next, April 6, 1859, at 3½ o'clock P.M.

You, being a member, are requested to give your punctual attend, ance. Important.

Respectfully, yours,

JOSEPH P. WOODBURY,

Secretary.

DEFENDANT'S EXHIBIT Cd. — D.B.H., Special Examiner.

NOTICE OF A MEETING OF THE BOSTON ASSOCIATION OF PLANERS, DATED MAY 2, 1859.

[PUT IN EVIDENCE, PAGE 443, VOL. 1.]

ROOM 15, MERCHANTS' EXCHANGE,

BOSTON, May 2d, 1859.

SIR:

A regular meeting of the Boston Association of Planers will be holden at room 15, Merchants' Exchange, Boston, on Wednesday next, May 4th, 1859, at 3½ o'clock P.M.

You, being a member, are requested to give your punctual attendance.

Respectfully, yours,

JOSEPH P. WOODBURY,

Secretary.

COMPLAINANT'S EXHIBIT 44a. — D.B.H., Special Examiner.

EAST BOSTON, Mass., Feb. 27, 1854.

SAMUEL COOPER, Esq., Washington, D.C.

Dear sir, — Your favor of Feb. 25, 1854, is just received, and contents noted. I regret to learn that my model will not be received at the Patent Office, on account of the size. If you cannot urge them to receive it and you cannot cut it down in size without spoiling it, I think it would be best to get some of the model makers in Washington to make one, if it can be done without too great expense, and return to me the model when the new one is done. I want you to file the application so far as you can, to prevent any one from robbing me of the invention. I want you to look out well for the *pirates*. Please to let me hear from you as early as convenient.

Respectfully yours,

JOSEPH P. WOODBURY.

Please to turn over.

[Endorsed with pencil on the margin:] Only the postscript of this letter on the other side refers to the case in question. — S. C.

[Endorsed on the margin in ink:] Samuel Cooper.

[Endorsed on the margin in ink:] Exhibit A.

P.S. — You will remember that I informed you that I had a rejected application at the Patent Office which was filed in June, 1848, which was about the same time that my application was filed for my stationary cutter planing machine. The application that I allude to was for an improvement in pressure with the rotary cutter. I think I am justly entitled to a patent therefor, and I want you to call the case up while you are in Washington and get a patent for the most

you can. Mr. J. J. Greenough done my business at the time, and after the rejection it never was called up. I ordered Mr. Greenough to let the whole thing remain until I gave him further orders, and not in any event call for the return fee, which he agreed to do. Please to call upon Mr. Greenough about the matter.

Respectfully yours,

In haste. JOSEPH P. WOODBURY.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and deposed unto by him at the time of his examination.

Before me,

CHARLES E. HUSE,

U.S. Commissioner.

COMPLAINANT'S EXHIBIT 45. — D.B.H., Special Examiner.

BOSTON, March 18, 1854.

Sir, — I have the honor to transmit herewith power of attorney from *Jos. P. Woodbury*, to attend to a *rejected* application now in the Patent Office, for planing machine.

May I request you to transmit to me, —

1st. The specification and 1 drawing.

2d. Copy of letter of rejection.

3d. Estimate of the cost of a copy of the case upon which this case was rejected.

Very respectfully, your obt. servt.,

SAM. COOPER.

Hon. CHARLES MASON,

Commissioner of Patents,

Washington, D.C.

Planing Machine pending.

[Endorsed in the margin in ink:] Exhibit B.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper in writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination.

Before me,

CHARLES E. HUSE,

U.S. Commissioner.

COMPLAINANT'S EXHIBIT 45a. — D.B.H., Special Examiner.

UNITED STATES PATENT OFFICE,

March 23d, 1854.

Sir, — Your letter, enclosing power of attorney to Samuel Cooper, Esq., is received. The records of this office show that Joseph P. Woodbury's application for a patent for alleged improvements in matchers, has not been acted upon *at all*. The examiner reports that there is nothing in this office to explain how the mistake (which appears to have been made out of this office) could have arisen.

Very respectfully yours, &c.,

C. MASON,

Commissioner.

JOSEPH P. WOODBURY, Esq.,

care of SAMUEL COOPER, Boston, Mass.

[Endorsed in ink on the margin :] Exhibit C.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examinntion.

Before me,

CHARLES E. HUSE,

U.S. Commissioner.

[Endorsed in the margin in ink :] Samuel Cooper.

COMPLAINANT'S EXHIBIT 46. — D.B.H., Special Examiner.

BOSTON, May 6th, 1854.

Sir, — I have the honor to acknowledge receipt of Patent Office letter of March 23d, upon the subject of an *old* application for letters patent by Joseph P. Woodbury, for improvements in planing machine.

Under the circumstances related in this letter, is not Mr. Woodbury entitled to an early examination, without waiting to take his turn? His application has already been in the office many times longer (if I am rightly informed) than at any time it would have been required to wait in the ordinary course of things at the Patent Office.

Very respectfully, your obedient servant,

SAMUEL COOPER.

Hon. CHARLES MASON,

Commissioner of Patents,

Washington, D.C.

[Endorsed on the margin:] Exhibit D.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination.

Before me,

CHAS. E. HUSE,

U.S. Commissioner.

[Endorsed in the margin in ink:] Samuel Cooper.

COMPLAINANT'S EXHIBIT 46a. — D.B.H. Special Examiner.

UNITED STATES PATENT OFFICE,

20th June, 1854.

Sir, — In regard to your first claim—circular saws cut the depth of the tongue or groove, and ordinary chisels remove the surplus

wood. In the first place, you assert that this enables you to feed the material with as great velocity as you desire. So can any other tonguer and groover using circular saws for this purpose — of which there are many. See rejected case of G. C. Fisk, a tonguer and groover. He uses saws to remove the surplus; and if you can feed so fast, can he not? The patent of Beers, of 1834, also tongues and grooves by circular saws. In the second place, removing the surplus by ordinary chisels is old. You have, then, combined two old devices, each producing the same effect as heretofore, by each in the *same kind* of machines. Of course this is not invention, for if it were, by combining with the saws *any* other well-known device to remove the surplus, would be patentable, and hence an unlimited number of patents might be granted in this manner, depending for validity upon merely a different arrangement of the same devices. This view of the matter plainly sets aside your first claim.

Taking from each of several machines a device, and combining them in one — though it shall effect a better machine than any other, — is not patentable, for the reason that each of these features could enforce a unit of information, and thus render a patent invalid *ab initio*. The *first* claim is therefore refused.

Respectfully,

C. MASON,

Commissioner of Patents.

Mr. J. P. WOODBURY,

care of SAMUEL COOPER, Esq., Boston, Mass.

[Endorsed in ink on the margin:] Exhibit E.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination.

Before me,

CHAS. E. HUSE,

U.S. Commissioner.

[Endorsed in ink on the margin:] Samuel Cooper.

COMPLAINANT'S EXHIBIT 47.—D.B.H., Special Examiner.

MAY

Sir, — In the case of an *old* application for letters patent for method of matching boards, filed by Jos. P. Woodbury, I have been informed that the drawings and specification are not on file in the office. Mr. Woodbury has made diligent search for these papers, but has not succeeded in finding them. Will you please inform me to whom they were last delivered or sent, and also if, in case they cannot be found, I may be allowed to withdraw the model for the purpose of preparing new papers? This case, I am informed by the office, has never been acted upon.

Very respectfully your obt. servt.

SAM. COOPER.

Hon. CHAS. MASON,

Comr. Patents, Washington, D.C.

[Endorsed on the margin in ink:] Exhibit F.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination.

Before me,

CHAS. E. HUSE,

U.S. Commissioner.

[Endorsed in the margin in ink:] Samuel Cooper.

[Endorsed in the margin in pencil:] No. 6.

COMPLAINANT'S EXHIBIT 47a.—D.B.H., Special Examiner.

UNITED STATES PATENT OFFICE,
8th August, 1854.

Sir,—It is not in the power of this office to give any information respecting the application of Joseph P. Woodbury for a patent for a tonguing and grooving machine, more definite than that contained in the letter of 20th of June, 1854 (addressed to "Mr. Joseph P. Woodbury, care of Samuel Cooper, Esq., Boston, Mass,"), to which you are referred.

Respectfully,
C. MASON,
Commr. of Patents.

SAMUEL COOPER, Esq.,
Boston, Mass.

[Endorsed in ink in the margin:] Exhibit G.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination.

Before me,
CHAS. E. HUSE,
U.S. Commissioner.

[Endorsed in ink in the margin:] Samuel Cooper.
[Endorsed in pencil in the margin:] No. 7.

COMPLAINANT'S EXHIBIT 48.—D.B.H., Special Examiner.

BOSTON, August 25th, 1854.

Sir,—On the 18th of March last I forwarded to the Patent Office power of attorney in the case of an *old* application of Jos. P. Woodbury for improvement in planing machines, with the request that the

papers in the case might be forwarded to me. On the 23d March the office writes me that the case has not yet been examined. On the 6th May, 1854, not hearing from the office upon the subject, I again requested that I might be informed when this case would be examined. To this letter I received no reply; and on the 5th August I again addressed the Commissioner, requesting him to inform me if the papers and drawings in this case were lost, if I might be allowed to withdraw the model, for the purpose of preparing new ones. In reply to this letter I was informed that no more definite information could be given respecting this application than was contained in Patent Office letter of 20th June, 1854, addressed to Mr. Woodbury and my care. I am led to believe that the office does not refer in any of its letters to the old application of Mr. Woodbury's, but to a more recent one which is still pending in the office, as a letter dated 20 June, 1854, was received in the recent case, which contained no reference to the old one. The application upon which I desire information is, I believe, entitled "*An improvement in pressure in planing machines*," and was filed on or about *June* 3, 1848. If the specification and drawings in this case be in the office, I respectfully request that they may be forwarded to me. If there be neither drawing or specification in the case, will you please inform me, in reply to my letter of August 5, 1854, whether the model in the case can be withdrawn for the purpose of replacing the drawings and specification?

Very respectfully,
Your obt. servt.

Hon. CHAS. MASON,
Commissioner of Patents,
Washington, D.C.

[Endorsed in ink in the margin:] Exhibit H.
[Endorsed in pencil at top of letter:] Patent Office.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing, consisting of two half-sheets, paged 454 and 455

in the corner, was produced and shown to Samuel Cooper, and by him deposed unto at the time of this examination.

Before me,

CHAS. E. HUSE, *U.S. Commissioner.*

[Endorsed in the margin in ink:] Samuel Cooper.

[Endorsed in the margin in pencil:] No. 8.

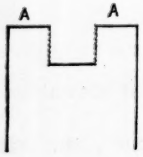
COMPLAINANT'S EXHIBIT 48a. — D.B.H., Special Examiner.

BOSTON, June 15th, 1854.

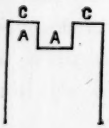
Sir, — I have the honor to acknowledge the receipt of Patent Office letter of 27th April last, upon the subject of Joseph P. Woodbury's application for letters patent for method of tonguing and grooving boards. With regard to the disallowment of the just claim, Mr. Woodbury requests me to offer a few remarks which he thinks will influence you to reverse your decision and to grant him a patent for this claim. It is stated in the Patent Office letter that Mr. Woodbury's devices "do what they have long since done in other machines," and that "they are old," "do nothing new separately," and "produce an old result." Mr. Woodbury does not claim his devices separately, but only in combination and it is maintained that this combination is just as legitimate, just as much a patentable combination, as though either one or both of them were in themselves new or of themselves performed some new duty, provided it can [be] shown that there is any peculiar adaptability of one device to the other, whether or not it be shown that they perform their duty better than all other devices made use of for the purpose. The ultimate object of improvement in machines of this class, as in most other machines, is to cause them to operate more rapidly and to do their work better. Now the rapidity with which the work may be performed depends upon the individual devices employed themselves; but the perfection with which it is performed depends upon the peculiar adaptation of the devices to each other. This I will illustrate as follows: —

The ordinary revolving cutter is liable to two objections: first, it

opposes a quick limit to the speed at which the material can be fed through the machine, and this objection is vital, and one which it is exceedingly important to remove; with this end, stationary cutters have been employed which enabled the feed to be accelerated as desired, but which leaves the sides of both tongue and groove rough, thus: while the edge A is exceedingly liable to be split off. Both these objections it is desired to remove. The method is also liable to another objection, which is this: the cutter must necessarily be of sufficient width to fill entirely the groove, and here is a great cause of friction, to which may be added that produced by the tearing away of both sides of the shaving from the wood, and the choking up of the narrow passage through which the shaving must escape. On the score of the rapidity of feed which these cutters permit, however, they offer all that is desired. Attempts have been made to precede cutters of various kinds for removing the wood from the groove by circular cutters formed thus: which were allowed to roll over the edge of the board in advance of the cutters, and thus mark the sides of the groove to a considerable depth before the shaving was removed; but this was found to be objectionable, and has resulted in no good. To remove all these objections, and at the same time to enable him to feed at any desired rate of speed, Mr. W. has adopted the following peculiar combination of parts, which, when united, are found to operate in the most perfect manner. It is for this peculiar combination of parts, which parts are not shown ever to have been used in combination before, that Mr. W. asks that a patent may be granted to him; and he believes that you will not refuse this to him, for the following reasons:—



1st. It is not shown that the combination which he employs has ever been employed for the purpose of tonguing and grooving.



2d. The sides A of the groove are left perfectly smooth and in a state preferred by the joiner.

3d. The corner C is left perfectly sharp, and is not split away, as is the case where either ordinary revolving cutters or the stationary cutters are used.

4th. The friction produced between the cutters and the sides of the grooves, and by the breaking and tearing out of the shavings and the choking up of the passage through which the shaving passes, is avoided.

5th. He is enabled to feed at a rate far exceeding that which can be ventured with any other tonguing and grooving apparatus with which I am acquainted.

These and other advantages he gains solely by the use of the combination of the circular saws with the stationary plane irons. The saw leaves the edges of the groove and tongue sharp and well defined, and the sides smooth, and in the state preferred by the joiner. The stationary cutter is then made narrower, so that it does not wound the sides of the grooves or create friction by tearing out the sides of the shaving; and there is scarcely a limit to the velocity at which the material may be fed through the machine. Surely there must be some way of protecting such a combination if it be new.

If under one patent it can * * * * * * that. Patents * * * * * *

Very respectfully, your
obt. servt.,
SAM. COOPER.

Hon. CHAS. MASON,
Commissioner of Patents,
Washington, D.C.

[N.B. — The stars in the above letter indicate that the press copy of the said letter at that point is illegible for the space of four (4) lines, on account on the certificate of the U. S. Commissioner before whom Samuel Cooper was examined being written over it; and it is therefore impossible to print the aforesaid four (4) lines.

DANIEL B. HILLIARD,
Special Examiner.]

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing, consisting of four (4) half-sheets, marked with the numbers 324, 325, 326 and 327 in the corners, was produced

and shown to Samuel Cooper, and by him deposed unto at the time of his examination before me,

CHAS. E. HUSE,
U.S. Commissioner.

[Endorsed in the margin in ink:] Exhibit I, Samuel Cooper.

COMPLAINANT'S EXHIBIT 48b. — D.B.H., Special Examiner.

UNITED STATES PATENT OFFICE,
29th AUGUST, 1854.

Sir, — The difficulty in relation to that *old* application of Mr. Joseph P. Woodbury, seems to have arisen from the fact that the case was not referred to in a sufficiently explicit manner. Mr. Woodbury having a pending application for a patent for a planing machine, and there having been no reference made to *the time when* the old application was filed, it was thought that the pending case was the one referred to. You are now informed that Mr. Woodbury's application for a patent for "Improvement in holding down material in planing machines," was withdrawn by J. J. Greenough, and the money paid to him, on the 4th of October, 1852, it having been rejected on the 28th of February, 1849. The specification and one drawing are in the office, one of the drawings having been withdrawn; and either of these can be forwarded if you desire it, but both cannot be sent out of the office at once.

Respectfully,
S. T. SHUGERT,
Act'g Comm'r of Patents.

SAML. COOPER, Esq.,
Boston, Mass.

[Endorsed in ink in the margin:] Exhibit J, Saml. Cooper.

[Endorsed in pencil at the bottom of this letter:]
Return this letter to me.
S. B.
[Old memorandum.]

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and deposed unto at the time of his examination before me.

CHAS. E. HUSE,
U.S. Commissioner.

COMPLAINANT'S EXHIBIT 49. — D.B.H., Special Examiner.

SEPT. 1.

Sir, — I have the honor to acknowledge receipt of Patent Office letter of 29th ulto., on the subject of Jos. P. Woodbury's *withdrawn* application for "Improvement in holding down material in planing machines," and to request that the remaining drawing may be forwarded to me, with the understanding that it shall be returned again to the office so soon as drawings for a new application can be prepared.

2dly. Please forward, at the earliest convenience of the office, a *copy* of the specification in the case, and also of the letter of rejection.

Very respectfully,
Your obt. servt.,
SAM. COOPER.

Hon. CHAS. MASON,
Com'r of Patents,
Washington.

[Endorsed in ink in the margin:] Exhibit K, Saml. Cooper.

[The balance of the date of this letter could not be deciphered, on account of the former exhibit being pasted on it.

D.B.H.,
Special Examiner.

At the execution of a commission for the examination of Samuel Cooper, in the action of the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination before me,

CHAS. E. HUSE,
U.S. Commissioner.

COMPLAINANT'S EXHIBIT 49a. — D.B.H., Special Examiner.

UNITED STATES PATENT OFFICE,
6th September, 1854.

Sir, — It was under a mistake of the examiner that you were told (in the letter from this office of the 29 ultimo.) that *either* the *drawing* or the *specification* of the application of Joseph P. Woodbury might be sent to you, but that *both* could not. As the application has been withdrawn, copies only of the specification, drawings, &c., can be furnished.

Respectfully,
S. T. SHUGERT,
Acting Commissioner of Patents.

SAMUEL COOPER, Esq.,
Boston, Mass.

[*Written with red lead pencil at the bottom of this letter:*]
"Rec. & ans'd Sept. 9, 1854."

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to said Samuel Cooper, and by him deposed unto at the time of his examination before me.

CHAS. E. HUSE,
U.S. Commissioner.

[Endorsed on the back in ink:] Exhibit L, Samuel Cooper.

COMPLAINANT'S EXHIBIT 50. — D.B.H., Special Examiner.

Sir, — I have the honor to acknowledge receipt of Patent Office letter of 6th instant, upon the subject of Joseph P. Woodbury's application for "method of applying pressure in planing machines," — *withdrawn*. As I do not understand by this letter that the office intend sending me the copies of the drawings and specification in this case, unless further requested to do so, I beg that such copies may be forwarded to me, the amount being charged to my account.

Very respectfully,

Your obedient servant,

SAM. COOPER.

Hon. CHAS. MASON,
Commissioner of Patents,
Washington, D.C.

[*The date of this letter is covered up by the preceding exhibit being pasted upon it.—D.B.H., Special Examiner.*]

[Endorsed in the margin in ink:] Exhibit M, Samuel Cooper.

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination before me.

CHAS. E. HUSE,
U.S. Commissioner.

COMPLAINANT'S EXHIBIT 50a. — D.B.H., Special Examiner.

Sir, — I have the honor to request that you will forward to me a copy of the letter of rejection addressed to Joseph P. Woodbury, on the 28th February, 1849, in the case of his application for letters

patent for "Improvement in holding down material in planing machines."

Very respectfully,

Your obedient servant,

SAM. COOPER.

Hon. CHAS. MASON,

Commissioner of Patents.

[Endorsed in ink:] Exhibit N, Samuel Cooper.

[*The date of this letter is covered up by the preceding exhibit being pasted upon it.—D.B.H., Special Examiner.*]

At the execution of a commission for the examination of Samuel Cooper, in the action between the Woodbury Patent Planing Machine Company, complainant, and Allen W. Keith, defendant, this paper writing was produced and shown to Samuel Cooper, and by him deposed unto at the time of his examination before me.

CHAS. E. HUSE,

U.S. Commissioner.

COMPLAINANT'S EXHIBIT 51.—D.B.H., Special Examiner.

THE UNITED STATES PATENT OFFICE.

To all persons to whom these Presents shall come, GREETING:

This is to certify that the annexed is a true copy from the files of this office of the file wrapper and contents and drawings in the matter of the letters patent granted Joseph P. Woodbury, dated April 29, 1873, No. 138,462, for "Improvement in planing machines."

In testimony whereof, I, J. M. Thacher, Acting Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this fifth day of June in the year of our [SEAL] Lord one thousand eight hundred and seventy-three, and of the independence of the United States the ninety-seventh.

J. M. THACHER,

Acting Commissioner.

POST-OFFCE BOX No. 4135,
BOSTON, Mass., November 18, 1870.

To the Commissioner of Patents, Washington, D. C.

Sir, — Inclosed I send you my application, with a certificate of deposit for fifteen dollars, for a renewal of my application for a patent for an improvement "in holding down material in planing machines," filed in the Patent Office June 3, 1848.

Please to acknowledge the receipt by letter addressed to my box, No. 4135, Boston, Mass.

Respectfully yours,

JOSEPH P. WOODBURY.

[Endorsed:]

$\frac{7\,9}{7\,0\,1}$ No. 1.

J. P. Woodbury.

Letter transmitting first fee. Filed Nov. 21, 1870.

"A."

Patent Office, Nov. 21, 1870.

No. 1.

POST-OFFICE BOX 4135,
BOSTON, Mass., Nov. 30, 1870.

To the Commissioner of Patents, Washington, D.C.

Sir, — On the 18th instant I enclosed and mailed to you my petition, specification, oath and drawing, together with a certificate of deposit for fifteen dollars, for the purpose of renewing my application filed in the Patent Office June 3, 1848, for an improvement in holding down material in planing machines. Said oath and application sent you on the 18th instant, was dated October 24, 1870. I received a letter from you, enclosing a copy of the Patent Office rules, dated November 22, 1870, in answer to my letter of the 18th instant, referring me to the fortieth and forty-first rules, which I could not well understood; and I wrote you again on the 26th instant, asking whether all of the documents and papers heretofore enumerated and mailed to you on the 18th instant, were received, and if so, whether any of them were considered by you to be wanting in formality to comply with the rules of the office.

I have not yet received any reply to my letter to you dated the 26th inst. After writing my letter to you under date of November 26, 1870, I received a letter dated Washington, D.C., November 26, 1870, from Hon. Joel Giles, who informed me that he had been to the Patent Office, as requested by me, and examined the documents and papers sent to you on the 18th inst., which were intended to renew my application filed in the Patent Office June 3, 1848, for an improvement in holding down material in planing machines, and that you informed him that the petition was not sufficiently formal to comply with the rules of the Patent Office, and that you advised me to make a new petition, oath, specification and drawing in the same form as though there had never been an application for the same invention filed June 3, 1848, as aforesaid. I have this day done as you requested, and have addressed and mailed to you my petition, oath, specification and drawing, the certificate for fifteen dollars having been sent to you on the 18th inst., which is intended to renew my application filed in the Patent Office June 3, 1848, for an improvement in holding down material in planing machine. Will you please to inform me whether my application is now satisfactory to you, and also whether my model filed June 3, 1848, can be used in my new application for a patent sent to you this day?

Very respectfully yours,

JOSEPH P. WOODBURY.

[Endorsed:]

$\frac{79}{701}$ No. 1.

J. P. Woodbury.

Letter in regard to preparation of papers.

Filed Dec. 5, 1870.

"B."

Patent Office, Dec. 5, 1870.

No. 1.

To the Commissioner of Patents:

The petition of JOSEPH P. WOODBURY, *of* BOSTON, *in the County of* SUFFOLK *and State of* MASSACHUSETTS, —

Respectfully represents, that your petitioner has invented cer-

tain new and useful improvements in HOLDING down MATERIAL in PLANING MACHINES, which he verily believes has not been known or used prior to the invention thereof by your petitioner. He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same, upon the terms and conditions expressed in the act of congress in that case made and provided; he having paid fifteen dollars into the treasury, and complied with the other provisions of the said act.

And the said do hereby constitute and appoint WILLIAM EDSON, of Boston, Massachusetts, or his legally authorized agents, lawful attorney and agent, to alter and modify the specifications and drawings in application for letters patent for

and to manage said application as he may deem expedient; to withdraw the application should he think it advisable; and to receive and transmit the patent when granted.

Signed at Boston this thirtieth day of November A.D. 1870.

JOSEPH P. WOODBURY.

"1."

To all whom it may concern: I, JOSEPH P. WOODBURY, of BOSTON in the COUNTY of SUFFOLK and STATE of MASSACHUSETTS, have invented a certain new and useful improvement in HOLDING DOWN MATERIAL in PLANING machines, and that the following is a full, clear and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying and using the same, reference being had to the accompanying drawing, which shows a side elevation of a machine, with the improvement attached.

Erase "1" and insert "A" of amendment filed May 7, 1872.

Various devices have been resorted to for the purpose of holding down plank and boards to be planed by machinery, the most common of which is a pair of rollers placed before and behind the cutters; but it is found in practice that the rapidly revolving cutters

cause a tremulous motion in the plank or board, and cause a succession of wavy cuts, much greater than if the board was held fast. Besides this, when rollers are used, they cannot be made to bear upon the board near enough to the cutters to prevent a spring in it, and they roll over the chips and shavings and make indentations on the boards. My improvement is made to counteract these defects, which has been found by long experimental practice to obviate all the difficulties.

The frame, platform, cutters, &c., are like those of the ordinary cylinder planing machines; but instead of the rollers above named, I employ a straight, smooth bar of metal, which is so placed as just to clear the edges of the cutters. In the drawing, the end of such a bar is shown at *a*; it is connected with the cutter frame, and rises and falls with it, and has besides a separate adjustment if required. Another mode of attaching the bar, and the one best adapted to bear upon the unplaned plank, is to connect it with the frame by means of a bent spring, shown at *b* in the drawing, one end of which is affixed to the bar *c*, the other to the cutter frame. In the drawing this bar is set off some distance from the cutter, in order to show it more distinctly; but it may be brought nearly up to the cutter, with only sufficient distance between to allow such play to the bar as is necessary to conform to the irregularities of the board to be planed. A board thus held down is kept steady, and the tremor so obvious when rollers are used is entirely checked; the plank is planed smooth and with much less chance of damage to the cutters.

Having thus fully described my improvement in holding down boards in planing machines, what I claim therein as new, and for which I desire to secure letters patent, is the employment of straight stationary bars, in combination with the rotary cutters as described, whether attached to the frame by springs or otherwise.

JOSEPH P. WOODBURY.

FRANK C. PARKER,
WILLIAM EDSON,
Witnesses.

CITY OF BOSTON,
COUNTY OF SUFFOLK, } ss.
STATE OF MASSACHUSETTS,

On this 30th day of Nov. 1870, before me, the subscriber, a justice of the peace, personally appeared the within-named JOSEPH P. WOODBURY, and made solemn oath that he verily believes himself to be the original and first inventor of the within-described improvements in HOLDING DOWN MATERIAL in PLANING MACHINES, and that he does not know or believe the same was ever before known or used; and that he is a citizen of the United States.

WILLIAM EDSON,
Justice of the Peace.

$\frac{79}{701}$ [Endorsed:] No. 1.
J. P. Woodbury.
Spec. papers. Filed Dec. 5, 1870.
Patent Office. Dec. 5, 1870.
No. 1.

UNITED STATES PATENT OFFICE,
WASHINGTON, D.C., Dec. 15th, 1870.

JOSEPH P. WOODBURY, P.O. Box 4135, Boston, Mass.

Please find below a communication from the examiner in charge of your application for patent for improvement in holding down material in planing machines, filed Dec. 5, 1870.

Very respectfully,

Commissioner.

EXAMINER'S ROOM, No. 3.

The application above referred to has been carefully examined. The applicant is referred to the patent granted to B. Brown, Oct. 9th, 1845, and the abandoned application of J. P. Woodbury, withdrawn Oct. 4, 1852, both for "Improvement in planing machines," as fully anticipating the application. A patent must therefore be refused.

JOHN C. TASKER,
Examiner.

$\frac{79}{701}$ [Endorsed:] No. 2.
J. P. Woodbury.
1st Rejection. Decem. 15, 1870.

DISTRICT OF COLUMBIA, } ss.
CITY OF WASHINGTON, }

James A. Woodbury, of Boston, Massachusetts, being duly sworn, on oath deposes and says: that he is fifty-one years of age, and is by occupation a mechanical engineer, and has followed such occupation twenty years; that he is well acquainted with Joseph P. Woodbury, said Joseph being his brother; that he is familiar with the invention for which his brother filed an application June 3d, 1848; that said invention consisted in the employment of straight stationary bars in combination with the ordinary rotary cutters of a planing machine, for the purpose of holding the board, while being planed, steady, and thus avoiding the tremulous motion that accompanied the use of rollers; that he was informed and believes that said application was rejected and withdrawn; that from the time of said rejection to the present time, his brother has constantly insisted that said rejection was on references that did not anticipate his invention, and that he should never abandon the same; that he has frequently heard his brother say that he supposed, and had been advised by counsel, that the Patent Office held and insisted that a failure to prosecute his said application for a period of two years subsequent to a rejection and withdrawal, acted as a bar to a further prosecution of the same, but that he expected to revive the same either by a special act of Congress or by or under some special law that would allow him to revive the same.

That he has frequently heard his brother say and insist, that the withdrawal of his application was made without his knowledge or consent, and that when such withdrawal was brought to his attention, the two years had already expired.

JAMES A. WOODBURY.

Subscribed and sworn to before me this 7th day of April, 1871.

J. McKENNEY,
[SEAL] *Notary Public.*

[Endorsed:]

$\frac{77}{701}$ No. 3.

J. P. Woodbury.
Affidavit of James A. Woodbury.
Filed April 25, 1871.
Patent Office.
April 25, 1871.
U.S.A.

DISTRICT OF COLUMBIA, }
WASHINGTON, D.C., } ss.

I, Joseph P. Woodbury, of the city of Boston in the County of Suffolk, and State of Massachusetts, on oath depose and say: that I am fifty-five years of age; I am a mechanical engineer. On the third day of June in the year eighteen hundred and forty-eight, I made application at the Patent Office in the city of Washington in the United States of America, for a patent for holding down material in planing machines, substantially combining pressure bars with rotary cutters. The primary examiner in the Patent Office, after duly considering the case, rejected my application on or about February 20th, 1849, on the ground that pressure bars were the same as pressure rollers, which had been used in planing machines. I then considered, as I do now, that the opinion of the examiner was entirely wrong, inasmuch as a pressure bar is entirely unlike a pressure roller in its construction and mode of operation. A pressure bar in combination with a rotary cutter, among many other advantages, produces two results which cannot be accomplished with a pressure roller. A great trouble is experienced in the use of the pressure roller by the gummy substances oozing from the wood and rolling up and adhering to the roller, causing all the chips and other substances on the board to adhere to the roller and roll over the planed surface of the board or plank, causing indentations in the same. The rapid action of the rotary cutters on the plank causes a great tremor of the material. The rollers bearing upon a single line point on the periphery of the same, very imperfectly overcomes this trouble; and then again, they cannot

be placed near enough to the cutting edges to prevent the cutters from tearing out the knots and shakes of the board or plank.

The pressure bars in combination with the rotary cutters effectually overcomes all these difficulties. In making the bar concave to conform to the convex surface of the cutting wheel, the bars can be brought close to the cutting edges, thereby holding the fibre of the wood together, preventing any knots or shakes being thrown out by the cutters, and the pressure bar presses on a broad surface of the material, thereby holding it much more steady, and preventing all tremor in the same, causing the surface to be much more smooth than is possible to produce with the pressure roller.

I never intended to abandon my invention. I always believed that I ought to have had granted to me a patent for said invention. I always intended to get a patent therefor if I could. At the time I received the aforesaid rejection, I was in the city of Washington, and had barely money enough to pay my expenses home. Nothing was left for me but to go home and attend to the wants of a large family. On or about the twenty-fourth day of October, 1852, as appears by the records attached to my said application in the Patent Office, J. J. Greenough withdrew my application, and received back from Patent Office twenty dollars in money without my knowledge or consent, and I have not seen said Greenough or received any communication from him since that time. I did not owe him anything at the time he received the twenty dollars from the Patent Office, and I have never received one cent of the twenty dollars up to this time. I did not know that said Greenough had withdrawn said application until two years afterward, and I did not know that said Greenough had any power to withdraw said application.

In the year 1854 I employed Samuel Cooper, a patent solicitor, then residing in the city of Boston, to take up my aforesaid rejected application, and to prosecute it to the full extent of the law in his endeavors to get a patent therefor.

He had a great deal of trouble in getting any information about the case. Letters were passing between him and the Patent Office during a period of several months before any definite information could be obtained. At last, to my great astonishment, Mr. Cooper

told me that he had been informed by the Patent Office that J. J. Greenough had withdrawn my application two years previous, and received from the Patent Office twenty dollars allowed by law, and that the practice of the office, two years having expired since the withdrawal, would not allow me to renew and revive my application for my said invention. This was sad news indeed for me, although I have always intended and hoped in some way, by some special act of congress or some change in the patent laws that I should be enabled to get a patent for said invention. I have never relinquished my intentions or hopes, although so long deferred. Whenever I have seen or had knowledge that any party or parties were making or using said pressure bars in combination with rotary cutters, I have promptly notified them that it was my invention, that I had made an application for a patent, that I intended to obtain it as soon as I could, and that when obtained I should hold them responsible for making or using said invention. The great delay in getting my patent has been a constant source of grief and irritation which has impaired my health and made an old man of me when I ought to be comparatively young. In December, 1869, I noticed in the "American Artisan" the decision of Judge Fisher in the case of the application for a patent by John W. Cochran for an improvement in breech loading rifles, overruling the commissioner of patents, who had decided that two years' delay after withdrawing the application was abandonment of the invention. Judge Fisher held "that a party having once made his application for a patent for a new and useful discovery or machine, a right has accrued to him to have his letters patent for that invention upon the payment of the price stipulated by the law, which right when once accrued is not barred by any act of limitation." This righteous decision made it certain to my mind that the Patent Office would now issue to me a patent for my aforesaid invention which had so long been denied me. I was about to renew my application for my said invention, when I was informed that Congress was about to make additional laws to secure more thoroughly the rights of inventors by granting them patents, by filing renewed applications for inventions that had been for a great many years wrongfully rejected by the Patent Office, so that justice might be done the

real inventor, no matter how long such justice had been delayed. The law of July 8th, 1870, the proviso of section 35, fully secures those rights, provided a renewed application shall be filed within six months from the passage of such act. In accordance with said provisions of the law, I filed in the Patent Office, on the fifth day of December, 1870, an application to revive and renew the application made by me June 3d, 1848, the specification, drawings, claim and model being the same as the application filed June 3d, 1848. I now claim and believe that the Patent Office, with due regard to my rights as an inventor, should forthwith issue letters patent according to law for my aforesaid invention.

JOSEPH P. WOODBURY.

Subscribed and sworn to before me this 18th day of April, 1871, at Washington City, D.C.

J. McKENNEY,

[SEAL] *Notary Public.*

[Endorsed:]

$\frac{79}{701}$ No. 4.

J. P. Woodbury.
Affidavit of J.P.W.
Filed April 25, 1871.
Patent Office.
April 25, 1871.
U.S.A.

POST-OFFICE BOX 4135,
BOSTON, Mass., June 16, 1871.

To the Commissioner of Patents, Washington, D.C.:

Sir, — I hereby revoke all powers of attorney heretofore given by me to any person or persons to act in my pending application for a patent for holding down materials in planing machines, originally filed June 3, 1848, and filed anew December 5, 1870.

Please to acknowledge the receipt of this letter.

Respectfully yours,

JOSEPH P. WOODBURY.

Letter June 22, 1871, A.M.

$\frac{79}{701}$ [Endorsed:] No. 5.
J. P. Woodbury,
Revocation of all Powers of Attorney.
Filed June 19, 1871.

BOSTON, Massachusetts,
July 8, 1871.

S. D. COZZENS, Esq., No. 22 West 15th street, New York city:

Dear sir,—Understanding that you will soon be able to go to Washington, I would request and authorize you to ac tfor me as my attorney in procuring a patent upon my pending application for holding down materials in planing machines, originally filed June 3, 1848, and rejected, and filed anew December 5, 1870, under the law of 1870; but I wish it understood that this power of attorney does not permit you to make any amendments whatever in the specification or claims of the application. Please do the best you can with the matter, and if it becomes necessary, please consult with Hon. S. S. Fisher, Mr. A. B. Stoughton and Messrs. Dodge & Munn, who will act with you as counsel in the case.

Very respectfully yours,
JOSEPH P. WOODBURY.

(This power of attorney was admitted by Gen. S. A. Duncan, Asst. Commissioner, July 11, 1871, —A.M.)

$\frac{79}{701}$ [Endorsed:] No. 6.
J. P. Woodbury, Power of Attorney.
S. D. Cozzens. Filed July 11, 1871.
Patent Office, July 11, 1871. U.S.A.
[50 ct. U.S. rev. stamp, cancelled.]

U.S. PATENT OFFICE, Washington, D.C.,
July 13, 1871.

Hon. M. D. LEGGETT,
Commissioner of Patents.

Sir,—In the pending case of Mr. Joseph P. Woodbury for improvement in holding down materials in planing machines, originally

filed June 3, 1848, and renewed under the act of July 8, 1870, I filed, on the 11th inst., a power of attorney from the applicant, and I have had to request that the case may be re-examined in accordance with the rules of the office, as I have studied the references given in the letter of rejection, and think I can show the office that they ought not to prevent the issue of a patent to the applicant.

Very respectfully,

S. D. COZZENS,
Atty. for J. P. WOODBURY.

79/701 [Endorsed:] No. 7.

J. P. Woodbury, request for re-examination.
Filed July 13, 1873.
Patent Office, July 13, 1871.

BOSTON, Massachusetts,
January 1, 1872.

Hon. Commissioner of Patents, Washington, D.C.

Sir,— In addition to the letter of attorney, dated July 8, 1871, heretofore given by me to my attorney, Mr. S. D. Cozzens, of New York city, in my pending application for an improvement in holding down materials in planing machines, originally filed June 3, 1848, and renewed December 5, 1870, under the law approved July 8, 1870, I hereby authorize my said attorney to make such amendments in the specification and claims of said application as in his judgment he may deem best, without, however, making any alterations or additions that are not shown either in the original specification, drawings or model.

Fifty cents. S. D. C. 50

JOSEPH P. WOODBURY.

79/701 [Endorsed:] No. 8.

J. P. Woodbury.
Letter to Office.
"Giving authority to his attorney to make certain kinds of amendments." Filed May 3, 1872.
Patent Office, May 3, 1872. U.S.A.
[50 ct. U.S. rev. stamp, cancelled.]

AMENDMENT.

The *Specification* of the Application of JOSEPH P. WOODBURY for *Letters Patent* for *Improvement in holding down material in planing machines*, originally *filed June* 3, 1848, and *renewed* under the *Act of Congress approved July* 8, 1870, is hereby *amended* as follows: —

Erase "1." By erasing [1] ~~the whole of the present specification, except the signatures~~, and substituting the following:

To all whom it may concern: —

"A." "2."

Be it known that I, Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts, have invented a new and useful Improvement in means for holding down material in planing machines; and I hereby declare that the following is a full, clear and exact description thereof, and of one mode in which my invention may be successfully put in practice, reference being had to the accompanying drawing, which represents a side elevation of a planing machine of suitable construction to be adapted to my improvement, and to which the latter is shown attached.

Insert "A." Erase "2" and insert "B" of amendment filed April 16, 1873.

Various devices have been resorted to before my invention for the purpose of holding down plank and boards to be planed by machinery. Of these the most common has consisted of rollers, one of which was placed before and another behind the cutters. But when such rollers are used, it has been found in practice that the rapid revolution of the cutters causes a tremulous motion in the plank or board, and produces a succession of wavy cuts, to a much greater extent than if the material be held fast and steady down to the bed of the machine. Besides this, the rollers cannot be made to bear upon the material near enough to the cutters to prevent the work from springing. In addition to these important defects, the rollers roll over the chips and shavings which come from the machine, and cause them to make indentation on the planed material.

My improvement is designed to obviate these evils; and it has

been found by long experience to be entirely successful for that purpose.

In applying my invention to practice, I construct the frame, platform, and most of the other parts of my machine, like those of the ordinary solid-bed cylinder planing machines which have long been in use. I adopt a rotary cutter, constructed and arranged in the usual way; but instead of a roller placed in front of and another behind it, as above referred to, I combine with the rotary cutter and with the solid bed [*in pencil, movable bed*] of the machine, straight, smooth, adjustable, yielding bars of metal, which I term "pressure bars," and which are adapted to press firmly upon the material to be planed. I prefer to employ two of these pressure bars, one in front of and the other other behind the rotary cutter, but one only may be used, if desired, and it may placed either before or behind the cutter, as preferred. These bars, whether one or both be employed, should preferably be so located and arranged as to just clear the edges of the cutters, as is seen in the drawing, where the end of one of my pressure bars is represented at *a*. This bar *a* is connected with the cutter frame, and rises and falls with the latter, so that the same means of adjustment which adjusts the cutter frame will also simultaneously adjust the bar. The bar is also provided with separate means of adjustment, in order that, when required, it may be adjusted independently of the cutter frame. The manner in which these adjustments are effected will be readily understood on inspection of the drawing.

Another mode in which the bar may be attached is to connect it with the cutter frame by means of a bent spring, as shown at *b* in the drawing, one end of the spring being secured to the frame and the other end to the bar. A bar thus arranged and attached is represented in the drawing at *c*. It is shown as set off some distance from the cutter, but this is mainly in order to represent it with distinctness. In practice it may be brought nearly up to the cutter, having only sufficient distance between the cutter and it to allow such play to the bar as may be necessary to enable it to conform to the irregularities of the material to be planed.

This mode of attaching the bar by a spring, is that which I con-

sider best adapted to enable it to bear properly upon the unplaned portion of the material, so as to yield, if necessary, to the inequalities of the latter. When, therefore, two bars are employed, one in front of and one behind the rotary cutter, as shown in the drawing, I prefer that the one behind the cutter, which is the bar which bears upon the unplaned part of the material, should be attached by means of a spring as described, or in some other equivalent manner.

When two bars are thus used, the bar *a* in front of the cutter will be required to bear only upon the *planed* portion of the material. It will not therefore ordinarily be necessary that it should have any yielding capacity; but if any such becomes needful, it will be provided by the slight elasticity of the arm which sustains the bar.

It will be observed that the bar behind the cutter is so connected with the cutter frame that the means for adjusting the latter will simultaneously adjust it also.

In a planing machine provided with my improvement, the material to be planed will be found to be so held down by my pressure bar or bars as to be kept steady, and the tremor which is so obvious when rollers are used is entirely checked, while the plank or board is planed smooth, and is freed from danger of having its surface dented by chips or shavings, and the operation is performed with much less liability of damage to the cutters than heretofore.

By inspection of the drawing it will be seen that the planing machine there shown is provided with a bed-plate or platform for sustaining and carrying the material to be planed, which is solid, rigid and unyielding, and which is placed directly underneath or opposite to the axis of the rotary cutter, so that it acts as an anvil, just under or opposite to the point where the successive blows of the cutter knives strike the surface of the material operated upon, and thereby prevents the latter from yielding or springing downward in the slightest degree. This solid bed or platform is one of the most essential features in a planing machine adapted to embody my improvements. Without it, the machine would fail of practical success.

It is well known that the edge-like cut produced by a rotary-cutter, of the kind represented in the drawing, is practically indispensible to the proper working of this class of machines. Such a cutter

takes off a thin chip or shaving, and therefore leaves the surface of the material in a condition most nearly resembling the effect of hand-planing, and, on this account, is another of the essential features in a machine adapted to my improvement. But as, in order to secure the best result in such cutters, the knives or blades are few in number, not usually exceeding two or three to each cutting wheel, and are fastened to the periphery of the wheel at considerable distances apart, the rapid revolution of the wheel causes them to successively strike upon the surface of the material with great force. This renders especially necessary in the machine the solid, anvil-like bed to which I have referred.

It is also well known that under the most favorable circumstances boards or planks before being planed are extremely irregular and uneven upon their surfaces, both lengthwise and crosswise. They are frequently, when sawed, thicker at one side or at one end than at the other, and they are likewise constantly liable, after leaving the saw, to become warped in seasoning or from other causes, so as to present very uneven surfaces either transversely or longitudinally, or in both directions at the same time. One important object in planing material containing any of these defects is to reduce it to as nearly as possible a uniform thickness throughout its length and width, and to take out the warp from it. This result my pressure bar or bars are especially adapted to effect in the most satisfactory manner, for the reason that as the rough, uneven, warped material which enters the machine at the end which is behind or at the right of the bar *c* in the drawing, passes first underneath this bar, the latter yields and accommodates itself, by reason of its spring connection, to all the irregularities of the material, and at the same time, without interfering with its being properly fed forward, presses and holds it down flatly and squarely on to the solid bed of the machine with the necessary firmness and steadiness to effectually prevent all tremor or "chattering," and to obviate any tendency to wavy cuts upon the surface; and by thus holding it causes the cutters to make the requisite depth of cut, or, in other words, to remove as much of the wood as may be necessary to give

the material a uniform thickness throughout and to take the warp entirely out of it.

It is essential to the production of this result that the pressure bar or bars should, on their lower side or surface where they bear upon the material, be smooth, and that they should be straight and rigid from end to end, and that they should have mass or thickness, so that they shall not bear upon the material merely as a thin edge would do, and finally and especially, that the entire mass or body of the bar or bars should, after the working adjustment of the parts of the machine has been made, and notwithstanding such adjustment, be capable of a yielding movement in an up and down direction to enable them to give and conform to the irregularities of surface of the material as it is fed through the machine; it being obvious that if the bars are so constructed that after they and the cutter have been adjusted to the general surface or gauge of the work to be done, the bars remain rigid and unyielding vertically, they will stop the material and prevent its being fed any further as soon as the rear one of them encounters in the material a greater thickness or irregularity than the general adjustment contemplates.

Mass or thickness, instead of a thin edge at the bearing surface of the bar, is also essential, in order to enable the machine to take warps out of the material treated. A thin edge would be found to yield lengthwise across the material, and hence to conform to or follow the curves of a warped board, and thereby make it impossible to take the warp out of it to any perfect extent. But as my pressure bar has sufficient mass or thickness to render it rigid from end to end at its bearing surface, it presses the warped portions of the board firmly down upon the bed of the machine, and holds them there steadily, making both sides of the board parallel in straight, instead of curved, lines, and so retains them until the cutters have taken the warps entirely out and the board has left the machine.

The capacity which my improvement presents of simultaneously and by the same mechanism adjusting both the cutter and the pressure bar or bars, enables the machine to be readily and quickly adjusted to plane different thicknesses of material without stopping it and without lengthening or shortening the driving belt.

This will be found in practice to be an important feature.

I make no claim to either the solid bed, the rotary cutter, or the adjustable mechanism considered by themselves, as they are old and well known.

But having thus made known my improvement, what I do claim and desire to secure by letters patent, is—

First. The combination in a planing machine of a rotary cutter, a solid bed, and a pressure bar or bars, the whole operating substantially as described.

Second. The combination in a planing machine of a rotary cutter and a pressure bar, when the cutter is so constructed and arranged that the entire mass or body of the bar has a yielding movement in an up and down direction, substantially as described.

Third. The combination and arrangement in a planing machine of a rotary cutter and pressure bar or bars, in such a manner that both the cutter and the bar or bars can be adjusted by the same adjusting mechanism, to plane different thicknesses of material without stopping the machine or altering the driving belt, substantially as described.

Fourth. The combination in a planing machine of the following elements: a rotary cutter, a solid bed, a pressure bar or bars, and a means of adjustment by which both the cutter and the pressure bar or bars may be simultaneously adjusted by the same mechanism, to plane different thicknesses of materials, the whole operating substantially as described.

JOSEPH P. WOODBURY,
S. D. COZZENS,
his Attorney.

[Endorsed:]

$\frac{7\,9}{7\,0\,1}$ No. 9.
J. P. Woodbury.
Amendment
Filed May 7, '72.
Patent Office,
May 3, 1872,
U.S.A.

UNITED STATES PATENT OFFICE,
WASHINGTON, D.C.,
May 11, 1872.

JOSEPH P. WOODBURY,
care S. D. COZZENS,
22 West 15th street, New York city:

Please find below a communication from the examiner in the matter of your application for Improvement in planing machines, filed Dec. 5, 1870.

Very respectfully,

Commissioner.

EXAMINER'S ROOM, No. 3.

The application above referred to was filed in this office Dec. 5th, 1870. Examined and rejected Dec. 15, 1870, upon reference to the patent of B. Brown, Oct. 9th, 1845, and the abandoned application of Joseph P. Woodbury, withdrawn Oct. 4th, 1852. The amendment introduced May 5, 1872, purports to be a renewal of the withdrawn and abandoned application of June 3d, 1848. The last communication received by the office from this applicant in regard to this application, and prior to filing his new application, was dated Sept. 1, 1854. From Sept. 1, 1854, to about the time the new application was filed, a period of more than sixteen years, this application was allowed to rest, and there is nothing on file to show that this applicant had made any effort to revive his application. Therefore, in view of the fact that this application was allowed to rest undisturbed more than sixteen years as a withdrawn and abandoned application, and that the device had been in common or public use during the whole time named above, and for the same purpose that the legal conditions which constitute abandonment as set forth Commissioner decision, Gray *v.* Hale, May 27, 1871, are fully applicable to this case, and in view of the above, this application is considered as abandoned.

JOHN C. TASKER,
Examiner.

The Supreme Court of the District of Columbia having overruled the position taken by the Commissioner in the Gray *v.* Hale case, this case must be considered on its merits.

M. D. LEGGETT,
Com.

[Endorsed:]

$\frac{74}{701}$ No. 10.

J. P. Woodbury.

Letter to Applicant. May 11, 1872.

"This paper contains an order from the commissioner to examine the application upon its merits."

No. 7 Warren St.,
New York, June 6, 1872.

Hon. Commissioner Patents:

Sir, — Please recognize Messrs. Knight Brothers, of Washington, as associate attorneys with me in the matter of the renewed application of Joseph P. Woodbury for letters patent for "Improvement in means for holding down material in planing machines," originally filed June 3, 1848.

S. D. COZZENS.

[Endorsed:]

$\frac{79}{701}$ No. 11.

J. P. Woodbury.

Associate P. of Attorney, Knight Brothers.

Filed June 8, 1872.

To the Commissioner of Patents, Washington, D.C.:

Hon. sir, — I hereby revoke all powers of attorney given by me to S. D. Cozzens, Esq., of the city and State of New York, or to any other person or persons whatsoever, to prosecute my application for a patent for holding down material in planing machines, originally filed June 3d, 1848, and a new application was filed December 5th, 1870, according to law approved July 8th, 1870.

Please to acknowledge the receipt of this revocation at an early

day, and address your communication to No. 1037 Shawmut avenue, Boston Highlands, Massachusetts.

Signed at Boston, Mass., June 19, 1872.

Very respectfully yours,

JOSEPH P. WOODBURY.

[Endorsed:]

$\frac{79}{701}$ No. 12.

J. P. Woodbury.

Revocation of all powers of attorney. Filed June 21, 1872.

Patent Office, June 21, 1872.

No. 1037 SHAWMUT AVENUE,
Boston Highlands, Massachusetts,
January 10th, 1873.

Hon. Commissioner of Patents, Washington, D.C.:

Hon. sir, — I herewith enclose the affidavit of James A. Woodbury and my own affidavit, and also a certified copy of the decision recently made by the Supreme Court of the District of Columbia in the case of the application of Joshua Gray for a patent for an improvement in rubber-tipped pencils; all of which I will hereby request you to file in my pending application for a patent for an improvement in holding down materials in planing machines, originally filed in the Patent Office of the United States, June 3d, 1848, and renewed according to the proviso in section 35 of the patent law approved July 8th, 1870, by filing a new application for the same invention in the Patent Office, December 5th, 1870. It is now only a few months since I was informed by one of my counsel in Washington, that Joseph E. Andrews, now deceased, formerly of Boston, made application for an improvement in planing machines, filed in the Patent Office, July 27th, 1846. The said Andrews described, *but does not claim*, pressure bars in combination with rotary cutters in said rejected and abandoned application, which was not renewed according to the law approved July 8th, 1870; but, on the contrary, said Andrews, in said application, *expressly disclaims the invention of said pressure bars in combination with said rotary*

cutters, and says that he knew that said pressure bars in combination with rotary cutters were used before his said application filed July 27, 1846. I have forwarded to the Patent Office the two aforesaid affidavits, in order that the office may be fully informed that I had a successful planing machine with pressure bars in combination with rotary cutters, in full operation, previous to July 1st, 1846, in my steam mill on Beverly street in the city of Boston. Said machine had the combination of pressure bars with rotary cutters, substantially like my specification, drawing and model filed in the Patent Office with my said application for a patent, June 3d, 1848, and that said Andrews frequently saw my planing machine having my said invention of pressure bars in combination with rotary cutters, in full and successful operation previous to July 1st, 1846, in said Beverly-street mill; and it was doubtless this machine that said Andrews referred to as having seen in operation previous to his said application for a patent. I have filed only the two enclosed affidavits on the matters therein mentioned, not wishing to encumber the Patent Office with a needless amount of papers; but any reasonable number of affidavits can be furnished by me, covering the same facts as therein stated, if wanted by the office; and if so, please to inform me, and I will send them. I have also filed the aforesaid certified copy of the late decision of the Supreme Court of the District of Columbia in the case of the application for a patent of Joshua Gray for a rubber-tipped pencil, as being a full and conclusive answer to the letter of rejection by the primary examiner, No. 3, sent to you, and by you sent to me, dated May 11th, 1872, rejecting my said application aforesaid, a copy of which is hereto annexed; and I will hereby request you to instruct, or order, said primary examiner to re-examine my said application for a patent, to ascertain, if in view of the decisions herein mentioned and enumerated, and others not herein mentioned, that have been decided or made public since said letter of rejection of May 11th 1872, that a patent ought now to be issued to me for the aforesaid invention, without further delay, by the Patent Office. I believe that a patent ought rightfully to be issued to me therefor immediately.

The decisions heretofore mentioned are as follows; to wit, —

First. The decision of the Supreme Court of the District of Columbia in the appealed case of the application of John W. Cochran for a patent for a breech-loading gun. The extract of the decision given by Judge Fisher in said case, in November or December, 1869, was in the following words: "*In my opinion, the spirit of our patent laws, and indeed their letter, simply requires an inventor, when he has discovered something which is novel and useful in the arts, to divulge to the world, through the medium of the Patent Office, the nature and character of his invention; and having done so, a right has accrued to him to have his letters patent for that invention upon the payment of the price stipulated by the law, which right, when once accrued, is not barred by any act of limitation.*"

It is understood that the former commissioner of patents who was in office when said decision was made, refused to obey the order of the court, and refused to issue the patent to said Cochran.

In the spring of the year 1872, the whole matter was called up and argued before Commissioner Leggett upon its merits and the law appertaining thereto, who ordered the patent to issue, and said patent did issue to said J. W. Cochran, in May, 1872, Commissioner Leggett thereby recognizing the just and righteous decision previously made by Judge Fisher. The above decision was made under the old patent laws that were in force previous to July 8, 1870. In my opinion, the 2d proviso in section 35 of the law approved July 8, 1870, must be considered cumulative to the old law in force previous to that date. From the foregoing decision, it clearly appears that the law in force previous to July 8, 1870, has been for more than twenty-five years erroneously and wrongfully construed by the Patent Office, and frequently by the courts, as, for instance, by the decision of Judge Morsell in the case of Mowry *v.* Barber, M.S. Appeal, Appeal Cases, in the following words; viz., —

"The withdrawing an application and receiving back the allowed part of the fee, will be considered as a final *abandonment of the further prosecution of the claim, and effects an entire extinction of all protection, saving and privilege under the act of* 1839, *section* 7, *and which cannot be revived by any new application.*"

Under the above erroneous and wrongful construction of the old

law, and by almost the uniform practice of the Patent Office, and also the courts, for a period of nearly or more than the past twenty-five years, *I could not revive my application filed June* 3, 1848, and the Patent Office would not have granted me a patent for said invention if I had made such an application for such a renewal any time after the withdrawal of my application, and which was withdrawn, without my knowledge or consent, about October 4th, 1852, by J. J. Greenough, as appears by the records in my case, and my affidavit in said case. I respectfully submit that in my opinion such an application would have been immediately rejected on the alleged ground that my invention had been abandoned by a withdrawal of the original application filed June 3d, 1848; and I respectfully submit that it appears to me to be cruel and oppressive treatment to say to me now, after I have suffered poverty and want for means to properly support myself and family for nearly twenty-five years, in consequence of the Patent Office rejecting my original application on the alleged and erroneous ground that a flat pressure bar was the same as a pressure roller, which erroneous rejection is now apparent and well understood by the public, and all others who have adopted the pressure bar as a superior and different instrument to the pressure roller in combination with the rotary cutter, on about all planing machines now in use, and that after congress has passed a remedial act in the 2d proviso of section 35 of the patent laws, approved July 8th, 1870, that I should now be rejected, as appears by the aforesaid letter, dated May 11th, 1872, on the ground that I neglected to renew my application for more than sixteen years from any official action, when, if I had made such attempted renewal, it would doubtless, at any time, have been, during the sixteen years aforesaid, rejected immediately, on the ground of abandonment, according to the previous practice of the Patent Office, which has doubtless occurred in hundreds, and perhaps the records of the Patent Office would show in thousands, of similar cases of rejected and withdrawn applications, during the period of twenty-five years previous to the passage of the 2d proviso in section 35 of the patent laws, approved July 8th, 1870.

Second. The decision made last May by the Supreme Court of the

United States in the case of the Dental Vulcanite Company *v.* Wetherbee, to the effect that lapse of time and public use between the filing of the original and withdrawn application and the filing of a renewed application, does not work abandonment.

Third. The decision of Commissioner Leggett in the Wire Telegraph case, published in the Official Gazette, July 9, 1872, and also the decision by the same in the Fluting Machine case, published in the Official Gazette, August 13, 1872, in which the commissioner says, on page 224, as follows, to wit, "*Congress evidently believed that the office had by unwarrantable rejections done injustice to meritorious inventors, and made the matter a subject for remedial legislation. In this case the office rejected the application, and the applicant had reason to believe, however meritorious his invention was in his own estimation, that the office had determined not to allow a patent. Under this impression, the natural result of the action of the office, he waited until he discovered a change in the office opinion, manifested by recognizing the invention as patentable, and such delay is not conclusive evidence, going to establish abandonment.*"

Fourth. The decision hereinbefore mentioned, reversing the commissioner's decision in the Joshua Gray case, and a copy of which is enclosed in this communication, made recently by the Supreme Court of the District of Columbia, shows that lapse of time and public use, between filing the first and the original application and the filing of the renewed application, does not work abandonment.

The second proviso, in section 35 of the patent laws, approved July 8, 1870, doubtless was intended to give the liberty to wrongfully rejected applicants for patents, if they renewed their application within six months from the passage of said act, by a new application, that said new application would revive the first application, and place him before the law and the Patent Office, the same and having all the legal rights that he had when said original application was filed; and if a patent should be issued on said application, it would stand in law the same as it would have stood if a patent had issued within one day or one month after said original application was filed; and upon the consideration of the case, in my opinion, it should be so considered by the Patent Office; and if it is so con-

sidered, then there is no interregnum between the first and second application, wherein the question of abandonment, by reason of public use or lapse of time, can come in for consideration. If congress did not intend to revive the original application and give the aforesaid legal effect to that act, then, I respectfully submit, that, in my opinion, a patent granted under the act would not be worth the parchment that it was written upon. But to give such a narrow construction of the law would be a perfect violation of the letter and the spirit of the law in the 2d proviso in sec. 35, approved July 8, 1870, which was intended to be liberal and remedial towards inventors, and to restore them to rights long obstructed and delayed.

In this case, therefore, I respectfully submit that we are considering the merits, solely, of the renewed application, originally filed June 3, 1848, and if I was *then* entitled to a patent for said invention, — and I have not nor never had a doubt but I was entitled to a patent therefor, — then I am manifestly entitled to a patent for said invention *now*, and in my opinion it ought to be immediately granted. When the act of the 2d proviso in section 35, which was approved July 8, 1870, was under consideration before congress, Gen. Butler, a member of the House from Massachusetts, remarked, in explanation of said proviso, as follows; to wit, "*An inventor invents a new and useful machine: the Patent Office decides that the machine is neither new nor useful; he yields to that decision, as a law-abiding citizen, and goes away; years afterwards it turns out to be useful, and another patents the machine. Now the patent should not be good in the hands of the man who thus patents it, and the man who invented it should not be deprived of it. It is a grievous wrong to deprive him of it, the previous decisions of the Patent Office being wrong. When the man himself goes for a patent, they say he has lost his rights by lapse of time. I say that a man driven out of court does not abandon his case. A man driven out of the Patent Office does not abandon his case.*"

Please to acknowledge the receipt of this letter, and also the receipt of the two affidavits, and the certified copy of the decision in the Joshua Gray's Rubber-Tipped Pencil case, by return of mail,

and direct all communications to me hereafter to No. 1037 Shawmut avenue, Boston Highlands, Massachusetts.

Very respectfully yours,

JOSEPH P. WOODBURY.

BOSTON, MASSACHUSETTS,
November 9, 1872.

In the matter of the application of Joseph P. Woodbury for a patent for holding down materials in planing machines, originally filed in the Patent Office June 3, 1848, and filed anew under the law approved July 8, 1870, bearing date December 5, 1870, I, Joseph P. Woodbury, the aforestated applicant, on oath depose and say: that I am fifty-six years of age; I reside in the city of Boston in the County of Suffolk and State of Massachusetts. I verily believe that I am the first and original inventor of the improvement claimed in said application, and I have never abandoned said invention to the public, or to any other party or parties whatsoever. I always intended to get a patent for said invention if I could possibly do so. I have never ceased to hope that justice would ultimately be done to me, and that my patent would be granted, as I have requested of the commissioner of patents.

I had one of my said improved planing machines made substantially like the model filed in the Patent Office June 3, 1848, with my said original application for a patent, in successful operation in a steam mill situated on Beverly street in said Boston, leased by me of one William Cheever, previous to July 1, 1846. I knew Joseph E. Andrews, formerly of said Boston, now deceased; said Andrews was often in my said steam mill previous to and subsequent to the first day of July A.D. 1846, and often witnessed the operation of my said improved planing machine, having pressure bars in combination with a bed and rotary cutters, for planing and reducing the boards or planks to a uniform thickness. Said Andrews always said that said improved pressure bars in combination with said bed and rotary cutters were my inventions, and often complimented me for having made such a new and valuable invention.

Said Andrews never claimed that he made said invention; but, on the contrary, always said it was my invention, and that I ought to have a patent therefor.

JOSEPH P. WOODBURY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. BOSTON, November 19, 1872.

Then personally appeared Joseph P. Woodbury, who subscribed the foregoing affidavit, and made oath that said affidavit, by him subscribed, is true.

Before me,

T. L. WAKEFIELD,

Justice of the Peace.

BOSTON, MASSACHUSETTS,
November 19, 1872.

In the matter of the application of Joseph P. Woodbury for a patent for holding down materials in planing machines, originally filed in the Patent Office, June 3, 1848, and filed anew under the law approved July 8, 1870, and bearing date December 5, 1870:

I, James A. Woodbury, on oath depose and say: that I am fifty-three years of age, and reside in Boston in the County of Suffolk and State of Massachusetts. I am a brother to said Joseph P. Woodbury.

I saw and examined the model filed June 3, 1848, with the original application. Said Woodbury had a planing machine made substantially like said model in successful operation in a steam mill on Beverly street in said Boston, previous to July 1, 1846, to the best of my recollection and belief.

Said steam mill was run by said Woodbury.

I knew very well Joseph E. Andrews, formerly of said Boston, now deceased. Said Andrews often visited said Beverly-street steam mill to witness the operation of said Woodbury's new planing machine, both before and after July 1, 1846.

Said improved planing machine had the combination of pressure bars, one placed on each side of a rotary cutting wheel, and the boards or planks that passed through the machine rested on a platform or bed, which supported the same, and were held firmly down by the pressure bars, while the rotary cutters planed and reduced the material to a uniform thickness.

Said Andrews freely admitted that said improved planing machine was the invention of said Joseph P. Woodbury.

JAMES A. WOODBURY.

COMMONWEALTH OF MASSACHUSETTS,

SUFFOLK, ss. BOSTON, November 19, 1872.

Then personally appeared the above-named James A. Woodbury, and on oath deposed and said the above declaration, by him subscribed, is true.

EVERETT K. DEXTER,
Justice of the Peace.

SUPREME COURT OF THE DISTRICT OF COLUMBIA,
in Banc.

In the matter of the application of Joshua Gray, of Medford, Middlesex County, Massachusetts, for Patent for Rubber-Tipped Pencils. No. 19, Dist. Ct. Doc. of Appeals.

APPEAL FROM THE COMMISSIONER OF PATENTS.

This cause came on to be heard upon the petition of Joshua Gray, the reasons of appeal, the answer of the commissioner thereto, and the certified copy of the record of proceedings in the Patent Office, and was argued by counsel for the appellant:

Whereupon, upon consideration of the premises, the court finds as follows: —

1. That the decision of the commissioner of patents that Gray had abandoned his application of 1856 and the invention described therein, although announced during the pendency of an interference, was the proper subject of an appeal to this court.

2. That the invention described by Gray in his original application filed in the Patent Office, September 18, 1856, was not and has not been abandoned by him.

It is therefore ordered, adjudged and decreed, that the decision of the commissioner of patents, refusing a patent to Joshua Gray, for the reason that he had abandoned his invention to the public, or that the same was in public use between the date of the filing of his original and his renewed application, be and the same is hereby reversed; and the application is remanded to the commissioner for further proceedings in accordance with this decision.

Without prejudice as to any other question or questions within the jurisdiction of the commissioner of patents.

By order of the court. A true copy.

R. I. MEIGS, *Clerk Sup. Ct. D.C.*,
by R. I. MEIGS, Jr., *Asst. Clerk*, &c.

[Seal of Supreme Court, District of Columbia.]

[Endorsed on back:]

No. 19, Patent Appeal Docket.

In re Joshua Gray, of Medford, Middlesex Co., Massachusetts.

[Copy.]

Decree denying abandonment.

[Copy.]

UNITED STATES PATENT OFFICE, (Copy.)

WASHINGTON, D.C., May 11, 1872.

JOSEPH P. WOODBURY,
care of S. D. COZZENS,
22 West 15th street, New York city.

Please find below a communication from the examiner in the matter of your application for improvement in planing machine, filed December 5, 1870.

Very respectfully,

Commissioner.

EXAMINER'S ROOM, No. 3.

The application above referred to was filed in this office, December 5, 1870, examined and rejected December 15, 1870, upon reference to the patent of B. Brown, October 9, 1845, and the abandoned application of Joseph P. Woodbury, withdrawn October 4, 1852. The amendment introduced May 5, 1872, purports to be a renewal of the withdrawn and abandoned application of June 3, 1848. The last communication received by the office from this applicant in regard to this application, and prior to filing his new application, was dated September 1, 1854. From September 1, 1854, to about the time the new application was filed, a period of more than sixteen years, this application was allowed to rest, and there is nothing on file to show that this applicant had made any effort to revive his application; therefore, in view of the fact that this application was allowed to rest undisturbed more than sixteen years as a withdrawn and abandoned application, and that the device had been in common or public use during the whole time named above, and for the same purpose that the legal conditions which constitute abandonment, as set forth Commissioner decision Gray *v.* Hale, May 27, 1871, are fully applicable to this case, and in view of the above, this application is considered as abandoned.

(Signed,) JOHN J. TASKER,
Examiner.

[Endorsed:]

$\frac{79}{701}$ No. 13.

J. P. Woodbury.

"Affidavits of J. P. & J. A. Woodbury," also copy of the decision of the Supreme Court of District Columbia in case of J. Gray, filed January 15, 1873.

PATENT OFFICE, January 15, 1873.

In the matter of the pending application of Joseph P. Woodbury for a patent for holding down materials in planing machines, originally filed June 3, 1848, and filed anew December 5, 1870. Letter dated January 10, 1873, enclosing the affidavits of Joseph P. Woodbury and James A. Woodbury; also the copy of the de-

cision of the Supreme Court of the District of Columbia in the case of Joshua Gray; also a copy of the letter of rejection of the application by the commissioner, dated May 11, 1872.

UNITED STATES PATENT OFFICE,

WASHINGTON, D.C., January 15, 1873.

JOSEPH P. WOODBURY, 1037 Shawmut avenue, Boston Highlands, Mass.

Please find below a communication from the examiner in relation to your application for patent and improvement in planing machines, filed December 5, 1870.

Very respectfully,

M. D. LEGGETT,

Commissioner.

EXAMINER'S ROOM, No. 3.

In the matter above referred to, a document purporting to be a letter of applicant, together with the affidavits of Joseph P. and James A. Woodbury, also copy of the decision of the Supreme Court of the District of Columbia in the case of Joshua Gray, and copy of the letters of rejection dated May 11, 1872, has been recived, and filed in the case.

JOHN. C. TASKER,

per CHANDLER.

[Endorsed:]

$\frac{79}{701}$ No. 14.

J. P. Woodbury.

Letter to applicant January 15, 1873.

To the Commissioner of Patents:

Sir, — In the matter of my application for letters patent for improvement in holding down materials in planing machines, filed Dec. 5, 1870, being renewal of application made June 3d, 1848, I hereby revoke all former powers of attorney to whomsoever

given, and appoint Messrs. Fisher & Duncan, 239 Broadway, New York, my sole attorneys for the prosecution of said application.

JOSEPH P. WOODBURY.

Washington, D.C., March 27, 1873.

[Endorsed:]

$\frac{79}{701}$ No. 15.

J. P. Woodbury, power of attorney to Fisher & Duncan, and revocation of all other powers of attorney.

Filed March 29, 1873.

Patent Office.

March 29, 1873.

U.S.A.

UNITED STATES PATENT OFFICE,

WASHINGTON, D.C., April 8, 1873.

JOSEPH P. WOODBURY,
care FISHER & DUNCAN,
239 Broadway, New York city, N.Y.

Please find below a communication from the examiner in the matter of your application for patent for improvements in planing machines, filed Dec. 5, 1870.

Very respectfully,

M. D. LEGGETT,
Commissioner.

EXAMINER'S ROOM, No. 3.

The application above referred to has been carefully examined.

In addition to the patent of Brown, previously given, applicant is referred to English patent No. 7926, granted to Wm. H. Burnet, Jan. 8, 1839, improvement in planing machine; also to the rejected application of John Andrews, filed June 12, 1846, and the rejected application of Joseph E. Andrews, filed July 27, 1846, as fully

anticipating the alleged invention. Applicant is also referred to the patents of Joseph E. Andrews, Nov. 21, 1845.

Improvement in planing machines.

In view of the above, a patent must be refused.

JOHN C. TASKER,
Examiner.

[Endorsed:]

$\frac{79}{709}$. No. 16.

J. P. Woodbury.

2d rejection.

April 8, 1873.

SUBSTITUTE SPECIFICATION.

Filed April 16, 1873.

"B." Specification describing a new and useful improvement in planing machines, invented by Joseph P. Woodbury, of Boston in the County of Suffolk and State of Massachusetts.

Insert "B."

The object of my present improvement in planing machines is to present the material to the cutter in such a manner as both to counteract, as far as practicable, the "fluttering" or tremor caused by the successive blows of the knives, and the consequent wavy and uneven surface of the planed work, and at the same time to overcome more perfectly than heretofore the tendency in the knives of the rotary cutter to loosen and dislodge the knots and "shakes," and to tear the fibres of the wood irregularly, instead of severing them smoothly along the exact surface desired.

To effect this twofold object, I make use of a device which I style a "yielding pressure bar," which possesses the following characteristics; viz., it is made of such material and has such mass as to be rigid from end to end, its under face is made flat, so that it has an extended bearing upon the work longitudinally of the machine; and it is mounted upon springs, so as, within certain limits, to accommodate itself to the varying inequalities in the surface of the material being operated on.

A pressure bar thus constructed and mounted differs from a pressure roller, ["3"] the usual device heretofore employed for holding down material in planing machines, in the following essential particulars; first, there is less liability to become coated with the gums of the wood, ["4"] which is always a disturbing element in machines that use the roller; second, there is no danger, as with the roller, that chips and other small fragments will be caught under it and pressed down into the planed surface of the wood; third, by reason of its extended bearing, it is more efficient to check the tremulous motion of the material under the rapid and powerful blows of the knives than the roller, the form of which is such that its bearings upon the work is necessarily along a single line only; and, fourth, the bar can be made to exert its pressure at points much nearer to the edge of the knives than would be attainable with the roller. This last point of difference is one of great practical importance. As the knives cut towards the unplaned portion of the stock, a large part of their work being performed during their ascent, there is a constant tendency for them to unseat the knots and tear out the "shakes" and the loose and irregular fibres of the wood. Hence the great desirability of bringing a strong pressure to bear in immediate proximity to the line along which the knives are operating; a result which is impossible when the roller is used, but with the bar is entirely feasible.

Insert "3." as per amendment filed April 22, 1873.

Erase "4," as per amendment filed April 22, 1873.

Besides the pressure roller for holding down material in planing machines, I am aware that it [here insert "C"] ["5"] has been proposed to make use of a flat spring, arranged transversely of the machine. [Here insert "D."] One essential difference between such a device and my pressure bar is found in the fact that the latter is perfectly rigid from end to end; from which it results that, when the knives begin to lift a knot, or shake or sliver, the entire force of the springs that support the bar is concentrated at the special point thus threatened, and thereby holds the weakened part in place. In like manner this element of rigidity in the bar causes the entire strength of the

Erase "5" and insert "C" of amendment filed April 22, 1873.

Insert "D" of amendment filed April 22, 1873.

springs to be concentrated upon any warp that may occur in one edge or in the middle of the material, which is thus reduced to a true bearing on the bed or the carriage of the machine. A flat pressure spring, on the other hand, having the same elasticity in all directions, will yield transversely of the work, as well as in a vertical direction, and, as a consequence, only a small part of its power can be brought to bear at a particular point, as with the stiff bar, to force the warped material to a true bearing on the machine, or to counteract the tendency of the cutter to tear out the knots and other weak parts. Another difference between the bar and the spring is, that the bearing of the latter upon the work, as in the case of the pressure roller, is only a line.

The mode in which I apply my invention is fully illustrated in the accompanying drawings, in which

Fig. 1 represents a longitudinal vertical section of a planing machine, through the line *y y* of fig. 2.

Fig. 2 is a plan view of the machine.

Fig. 3 represents a transverse vertical section on the line *x x* of fig. 1.

As my present invention has nothing to do with the framework of the machine, or with the parts specially designed for receiving and transmitting the power, these parts do not require to be described. A, represents one of my yielding pressure bars, which is shown in the drawings as set off at some distance from the path of the knives; but this is done in order to show it more distinctly. In practice it is to be brought much nearer to the cutter, leaving only sufficient space between it and the path of the knives to give it the requisite vertical play to enable it to conform to the irregularities of the stuff which is being planed. As this bar is specially designed to hold down the unplaned part of the material, it is provided with a spring at each end, here marked *a a*, some such compensating device being essential to the successful working of a bar occupying this position, by reason of the varying thickness of the rough stock. When, however, the bar is used to hold down the planed part of the stuff, inasmuch as the thickness of this portion has been reduced by the action of the cutter to an approximate uniformity, the springs may be dis-

pensed with, and the bar supported at the end of two arms extending out from the cutter frame. The elasticity of the metal composing these arms will ordinarily be sufficient to compensate for any actual variation from absolute uniformity of thickness in the planed material.

B represents a pressure bar of this description, supported on the arms *b b*. These arms, as well as the springs *a a* that support the bar A, are shown as attached to the frame that carries the cutter; from which it follows that both these bars will receive the same vertical adjustment of the cutter, and simultaneously with it, which is effected by means of the hand-nut C and the threaded rod D passing up through the arm E. The bar B is made capable of a separate vertical adjustment by means of the screws *c c*.

In order to facilitate the entrance of the work beneath the bars, one of the lower edges of each bar is slightly bevelled or rounded, as shown at *m* and *n*.

Directly underneath the cutter [here insert E] [6] I place a solid and unyielding bed-plate, H, which is designed to act as an anvil just under the point where the successive blows of the knives are delivered upon the material subjected to their action, and which is so constructed as effectually to resist the springing or yielding of the material in a downward direction. This bed-plate is extended far enough in front and in rear of the cutter to serve as a firm support under the pressure bars A and B.

Erase "C" and insert "E" of amendment filed April 22, 1873.

The stuff is carried forward to the cutter by means of an endless apron, revolving upon suitable shafts or rollers. This apron is composed of two or more endless belts or chains, to which are attached transverse slats or bars of metal. The bed-plate is cut away at the points where these belts or chains pass over it, so that the transverse metal slats, as they are carried across the face of the bed-plate, may be in direct contact therewith.

What I claim as my invention is—

1. The combination of a rotary cutter and a yielding pressure bar or bars, substantially as and for the purpose described.

2. The combination of a solid bed and a yielding pressure bar or

bars, for the purpose of holding down the material while being acted on by the cutter, substantially as set forth.

3. The combination of a solid bed, a rotary cutter and a yielding pressure bar or bars, substantially as described.

4. The combination of the two pressure bars, one of which is supported upon metallic [Erased before filing. — F.D.] arms, and the other upon springs, substantially as and for the purpose set forth.

[Endorsed:]

$\frac{79}{701}$ No. 18.

J. P. Woodbury.

Amendment.

(Sub. Spec.)

Filed April 16, 1873.

Patent Office, April 16, 1873.

U.S.A.

UNITED STATES PATENT OFFICE,

WASHINGTON, D.C., April 17th, 1873.

JOSEPH P. WOODBURY,
care FISHER & DUNCAN,
239 Broadway, New York city, N.Y.

Please find below a communication from the examiner in the matter of the application for patent for improvement in planing machines, filed Dec. 5, 1870.

Very respectfully,
M. D. LEGGETT,
Commissioner.

EXAMINER'S ROOM, No 3.

The application above referred to has been carefully examined as amended, without finding any good reason for changing the decision given in official letter of April 8, 1873.

The references therein given are still believed to fully anticipate the alleged invention. Said decision is therefore affirmed.

The affidavits of Joseph P. Woodbury, *this applicant*, and James Woodbury, *his brother*, have been filed in support of this application,

as against the reference to the application of Joseph E. Andrews, dated July 15, 1846, in which the bar is fully described and not claimed. These affidavits cannot be received or considered under sec. 37, Rules of Practice in the U. S. Patent Office, March, 1873. The specification contains matter that enlarges the original application, which must be erased if the case is proceeded with.

JOHN C. TASKER,
Examiner.

[Endorsed:]

$\frac{79}{701}$ No. 19.
J. P. Woodbury.
3d rejection.
April 17, 1873.

APRIL 22, 1873.

To the Commissioner of Patents:

Sir, — I hereby amend my pending application for letters patent for improvement in planing machines, filed originally June 31, 1848, by erasing *from the fifth and sixth lines of page* 2 of the *present speci-*

Erase "3." *fication* the words, "[3] the usual device heretofore employed." Also in *lines* 9, 10 *and* 11, *same page*, the words, "[4]

Erase "4." which is always a disturbing element in machines that use the roller."

Erase "5." Also on *page* 3, *line* 10, erase the words, "[5] has been

Insert "C." *proposed*," and substitute therefor the following: "[C] is proposed in the English patent of Burnett of 1839."

Insert "D." Also, *same page*, *line* 12, *after* the word "*machine*" insert "[D] and supported above its upper edge upon a bar which has a vertical adjustability."

Erase "6." Also, *page* 6, *line* 12, erase the words "[6] I place a,"

Insert "E." and insert in lieu thereof the words "[E] is the travelling bed or apron which rests upon the."

Very respectfully,

JOSEPH P. WOODBURY,
per FISHER & DUNCAN,
Attorneys.

[Endorsed:]

No. 20.

$\frac{79}{701}$
J. P. Woodbury.
Amendment.
Filed April 22, 1873.
Patent Office,
April 22, 1873,
U.S.A.

THE WESTERN UNION TELEGRAPH COMPANY,

10 Dated NEW YORK, April 26, 1873.
Received at 10.08 P.M.

To JAMES S. GRINNELL,
Chief Clerk.

Has case of Joseph P. Woodbury planing machine gone into next Tuesday's issue?

FISHER & DUNCAN.
13 paid.

UNITED STATES PATENT OFFICE,

WASHINGTON, D.C., April 26th, 1873.

Mr. J. P. WOODBURY,
care FISHER & DUNCAN,
New York.

Dear sir,—Your application for improvement in planing machines has been passed for issue in opposition to the judgment of the examiner, of the board of examiners in chief, and of the commissioner of patents; but in obedience to the decision of the Supreme Court of the District of Columbia, in the *ex-parte* case of J. Gray.

Very respectfully,

M. D. LEGGETT,
Commissioner of Patents.

$\frac{79}{701}$
U. S. Patent Office.
Application of
J. P. Woodbury.
Filed *November 21, 1870.*

Contents of this File.

1 *Application "A" & "B"*
2 Brief 1st R–15–12–73
3 *Affidavit J.A.W. 25–4–71*
4 " *J.P.W. 25–4–71*
5 *Rev. of P. of A.–19–6–71*
6 *P of A. — S.D.C. 11–7–71*
7 *R. fu'de — examination 13–7–71*
8 *Letter to Office — 3–5–72*
9 *Amendment — 7–5–72*
10 Brief Letter — 11–5–72
11 *A.P. of A.K.Bs. 8–6–72*
12 *R.P. of A. — 21–6–72*
13 *Affidavits J.A. & J.P.W. 15–1–73*
14 Brief Letter — 15–1–73
15 *P. of A. F. & D. 29–3–73*
16 Brief 2d R. — 8–4–73
17 *R. fu'de — examination — 16–4–73*
18 *Amendment — 16–4–73*
19 Brief 3d R. — 17–4–73
20 *Amendment — 22–4–73*

Memorandum of Fee Paid at
U.S. Patent Office.

Inventor.
Joseph P. Woodbury.

$20M

Invention,
Planing Machines.
Date of Payment.

Patent Office
Apr 22 1873
U.S.A.
Apr 22 '73

Fee,
$20.
Solicitor,
Fisher & Duncan.

Not in.

79
701 *1870.* (173)

No. 138,462.
Joseph P. Woodbury.
Of Boston
County of Suffolk
State of Mass.
Holding down material in
planing machines.
Rec'd Nov. 21, 1870
Petition Dec. 5, "
Affidavit " " "
Specification " " "
1 Drawing " " "
Model June 3, 1848.
1 Cert. dep. $15, Nov. 21 1870
Cash
Add'l Fee Cert.
1 " " Cash $20, April 22, 1873
Examined April 22 1873 Ex in Chief
2 Issue Apl 26, 1873. Grinnell
" Patented April 29, 1873
Recorded vol. , page
Circular.
Letter Nov 22 '70 P.O. Box 4135
J.D.P. *1870.* Boston
Fisher & Duncan
239 Broadway New York City.

1870.

1 Rejection Dec 15, 1870
Letter May 11, 1872
" Jan 15th 1873
Rejected April 8, 1873
" " 17, 1873.

Ex'd J.A.W.

Improvement in Planing Machines.

1870.

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Letter May 11, 1872
" Jan 15th 1873
Rejected April 8, 1873
" " 17, 1873.

Ex'd J.A.W.

Improvement in Planing Machines.

1870.

CLERK'S CERTIFICATE.

UNITED STATES OF AMERICA, }
MASSACHUSETTS DISTRICT, } ss.

I, John G. Stetson, Clerk of the Circuit Court of the United States for the First Circuit and District of Massachusetts, certify that the foregoing is a true copy of exhibits in the cause of The Woodbury Patent Planing Machine Company, complainant, *v.* Allen W. Keith, defendant, in said Circuit Court determined.

And I further certify that this volume, entitled "Vol. II, Exhibits," and one accompanying volume having my certificate of even date herewith thereto annexed, entitled "Vol. I, Pleadings and Evidence, Opinion and Decree of Circuit Court, etc," together contain a true copy of the record and of all proceedings of said Circuit Court in said cause.

In testimony whereof, I hereunto set my hand and affix the seal of said Circuit Court at Boston, in said District, this fifth day of September, in the year of our Lord, one [SEAL] thousand eight hundred and seventy-nine, and of the Independence of the United States, the one hundred and fourth.

JOHN G. STETSON,
Clerk.

CLERK'S ATTESTATION TO COPY.

A true copy of the original Transcript of Record, Vol. II, in the case of The Woodbury Patent Planing Machine Company, complainant, *v.* Allen W. Keith, defendant.

Attest: John G. Stetson
Clerk.